ARCHAEOLOGY AT TEKLANIKA WEST (HEA-001): AN UPLAND ARCHAEOLOGICAL SITE, CENTRAL ALASKA

By

Samuel C. Coffman

RECOMMENDED: ______________________

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Advisory Committee Chair

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Chair, Department of Anthropology

APPROVED: ______________________
Dean, College of Liberal Arts

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Dean of the Graduate School

Dec 15, 2011
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Date

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A

THESIS

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Samuel C. Coffman, B.A.

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ABSTRACT

This thesis research involved a reinvestigation of the Teklanika West (HEA-001) archaeological site, central Alaska. It focused on understanding and expanding upon the site formation processes, dating, and characterizing cultural components at the site. Analyses were designed to address the preceding research purposes, while inter-relating research objectives. Twelve and a quarter square meters were excavated within five blocks located across the site. These excavation blocks yielded dateable materials in clear association with chipped-stone technology. Both environmental and cultural data obtained at the site have produced a more complex understanding of the site and surrounding landscape. Multiple components ranging in age from the late Pleistocene through late Holocene are represented at the site. Lithic analyses indicate a wide variety of lithic reduction occurring within components; ranging from biface production to late-stage weapons maintenance. Faunal remains from the oldest components consisted of bison, while the mid-late Holocene components consisted of caribou and sheep, respectively. All these data indicate that the upper Teklanika River valley was deglaciated by the late Pleistocene, allowing humans access to animals, new travel routes, and raw material resources.

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CHAPTER 1: INTRODUCTION

Understanding human-landscape interaction is a focal point of archaeology. By examining relationships of artifacts, ecofacts, and features with landscape and environmental data, archaeologists can infer seasonal practices, trade/exchange networks, and landuse strategies. These provide the primary avenues for understanding human-landscape interactions. Much of our current understanding of prehistoric lifeways comes from deeply stratified sites within the upper Nenana and Tanana River valleys in conjunction with the Athabascan ethnographic record of the 18th and 19th centuries. There have been few sites in upland settings (sites at or above 762 meters (2500 ft) asl) that are deeply stratified and can be used to infer past activities and lifeways. Teklanika West (HEA-001) located in the upper Teklanika River Valley of the central Alaska Range of Denali National Park and Preserve offers these variables, which can provide useful insight into upland landuse.

The site is situated atop a bluff overlooking the Teklanika River. The site contains a rich amount of cultural artifacts, representing occupations to the site by groups of mobile hunters and gatherers. The site itself is significant for several reasons: it is deeply stratified, contains good organic preservation, and is located in a montane setting. Very little is known about how hunter-gatherers utilized upland resources, let alone understanding what type of resources were readily available to them in these upland settings. Teklanika West offers valuable insight into understanding the role uplands and upland resources played to hunter-gatherers. By addressing this relationship, new insights into understanding how prehistoric hunter-gatherer subsistence/settlement and technological strategies employed in the central Alaska Range have emerged. Teklanika West, like Carlo Creek (Bowers 1978, 1980) and Dry Creek (Powers et al. 1983), contains identifiable faunal remains in clear association with cultural materials. Contrary to previous lithic analyses of artifacts (cf. West 1965, 1967, 1981, 1996) no firm cultural affinities may be established, yet many different technologies are present at the site, possibly suggesting different culture groups or technological variations within a single or multiple tool-kits.

The primary purpose of this thesis is to understand human occupations at the site and how they interacted with local environments. Data are derived from interlinking studies of the site's stratigraphy, lithic, and faunal assemblages. Further interpretations about the site are drawn from additional paleoecological data and comparisons with other sites in central Alaska.

Research Objectives and Methods

Teklanika West is situated in an upland setting and is one of a handful of sites, which has the potential to shed light on how prehistoric hunter-gathers utilized upland resources. The site is important to upland settings because it is deeply stratified, contains well-preserved faunal remains, and a large number of lithic materials. Moreover, the site contains both lithic and faunal assemblages dated from the late Pleistocene through the Holocene offering an excellent opportunity to document changes in upland landuse through time. To address a large understanding of upland resources, site-specific research must be answered first. By answering the site-specific questions, a clearer understanding of upland habitation and use will emerge.

The research objectives for this project at Teklanika West were designed to investigate four main problem areas: (1) site formation and site disturbance, and their effects on recovered cultural materials; (2) number and age of the cultural occupation(s); (3) technological variability among components; and (4) faunal use and variability among components. A synthetic approach evaluating these four areas were used to infer site activities and explore their contribution to our understanding of late Pleistocene/early Holocene adaptations, following current debates in the literature (e.g., Mason et al. 2001; Bever 2006, West 1996, Potter 2008).

In order to tie in with earlier work, we reestablished the original datum (assumed to be from West's excavation from the 1960s and 1970s) and excavation grid. The placement of this excavation grid was oriented perpendicular to the bluff face. Twelve and a half m^2 units were positioned to capture variability across the landform (east and west as well as north and south) in order to characterize landform stratigraphy. Each unit was arbitrarily excavated in 5 cm levels by trowel with artifacts being three point-provenienced when encountered.

Sediment samples and descriptions were taken from all stratigraphic units to understand site formation and site disturbance factors. Additionally, stratigraphic profiles drawn during fieldwork were digitized and used to overlay the provenience of cultural materials to understand the relationship between the two. Subsequently, stratagraphic profiles, dating of cultural materials at the site, lithic and faunal analyses were all used to understand the site formation and site disturbance processes. These data greatly assist in understanding the number of components at the site and whether or not artifacts from Goebel's (1992) "Component 3", found under the root mat, represented an independent component or if it was comprised of artifacts re-deposited from the previous excavations. More research specific questions and detailed methods are discussed within each section of this thesis.

Each chapter in this thesis builds from analyses and interpretations from previous chapters. Chapter 7 summarizes and integrates the findings and places them within the larger framework of current knowledge of Alaskan prehistory within the context of upland landuse practices and change through time.

Research History at Teklanika West

The Teklanika West site lies at approximately mile 35 of the Denali Park road in the upper Teklanika River Valley of the central Alaska Range (Figure 1.1). The Teklanika River is fed predominately by meltwaters of the Cantwell Glacier, which heads some 30 km (19 miles) upstream from the site. The site is located in the Healy quadrangle and lies roughly 167 (104 miles) air kilometers southwest from Fairbanks and about 294 km (183 miles) north of Anchorage.

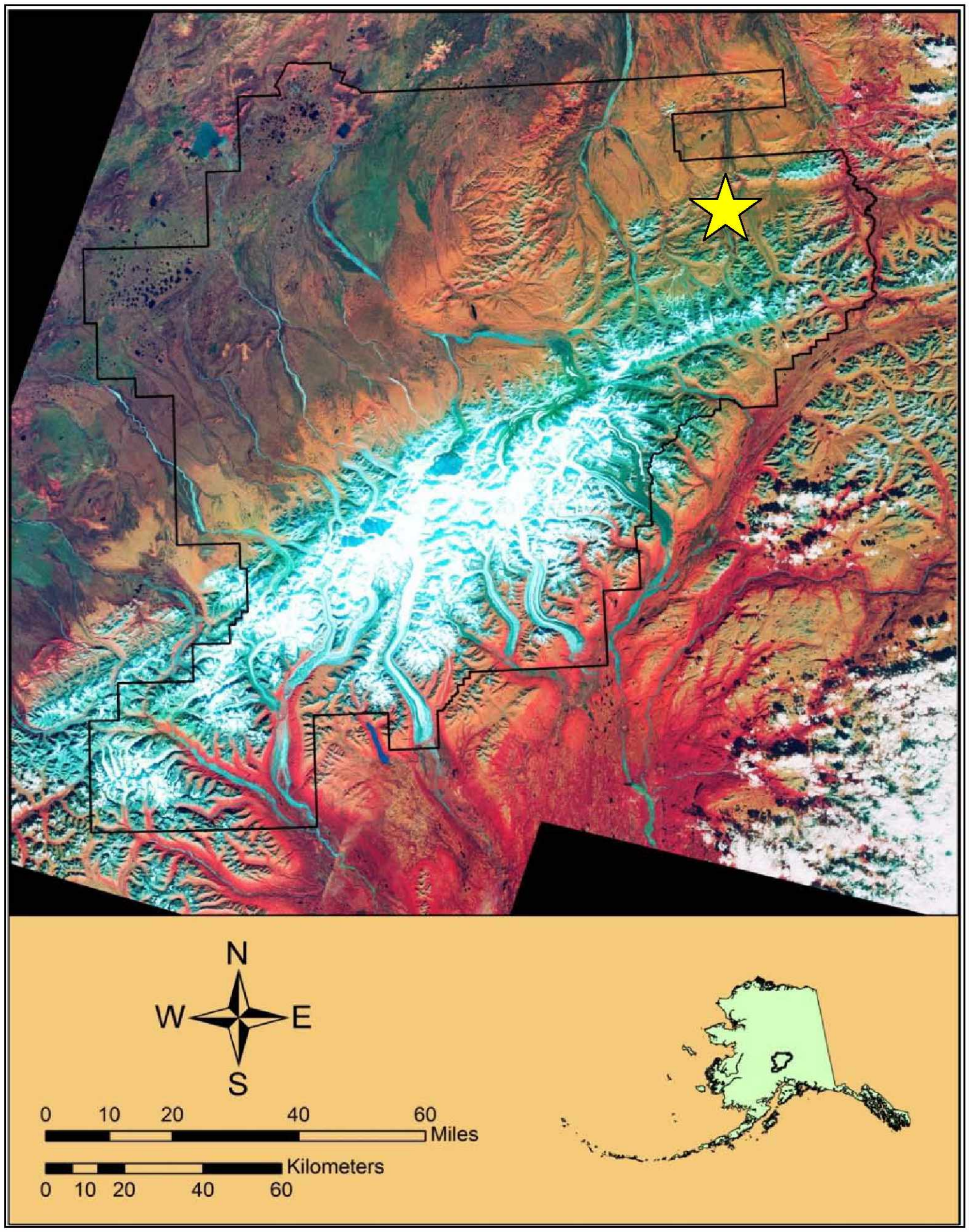

Figure 1.1. Denali National Park and Preserve, central Alaska. Location of Teklanika sites.

The site was discovered in 1958 by a group of University of Alaska Fairbanks geology students. However, it was not until 1960 that Ronald Forbes conducted the first investigations at the site. In 1961 Ronald Boyce and Burle Beard conducted additional investigations at the site under the direction of Frederick H. West. Henry Morgan (1965) revisited the site and excavated there in 1963. Subsequent excavations were carried out the following year (1964) by Aden Treganza. It was after 1964 that Frederick West became the major excavator at the site, conducting excavations at the site in 1964, 1967, 1968, 1970, and 1971 (Goebel 1992; West 1975). These early investigations were concentrated primarily on the surface exposure of the site, Figure 1.2. The majority of these artifacts were found eroding out. Treganza (1964) and West (1965) concentrated their excavations further away from the bluff's edge, Figure 1.2.

The site was mapped by Charles Holmes in the mid 1980s (Holmes personal communication 2009). A brief reconnaissance of the geoarchaeology of the site was conducted by Goebel in 1992 (Goebel 1992, 1996). Lastly, prior to the author's excavations, the Alaska Office of History and Archaeology personnel surface collected artifacts and mapped the site in the summer of 2006 (DePew et al. 2006). The most recent research conducted at the site was mine in the summer of 2009. The 2009 excavations recovered both lithic and faunal material associated with each over an area of 12.50 square meters (Coffman and Potter 2009) (Figure 1.3 and 1.4). To date, based on original site notes and excavation maps, about 29.75 square meters of the site have been excavated. In all, 15 total radiocarbon dates have been obtained from Teklanika West with 11 of those being new AMS radiocarbon dates from this study and approximately 10,558 (n≈9,000 artifacts from previous research and n=1,558 from this study) have been collected from the site by the various researchers.

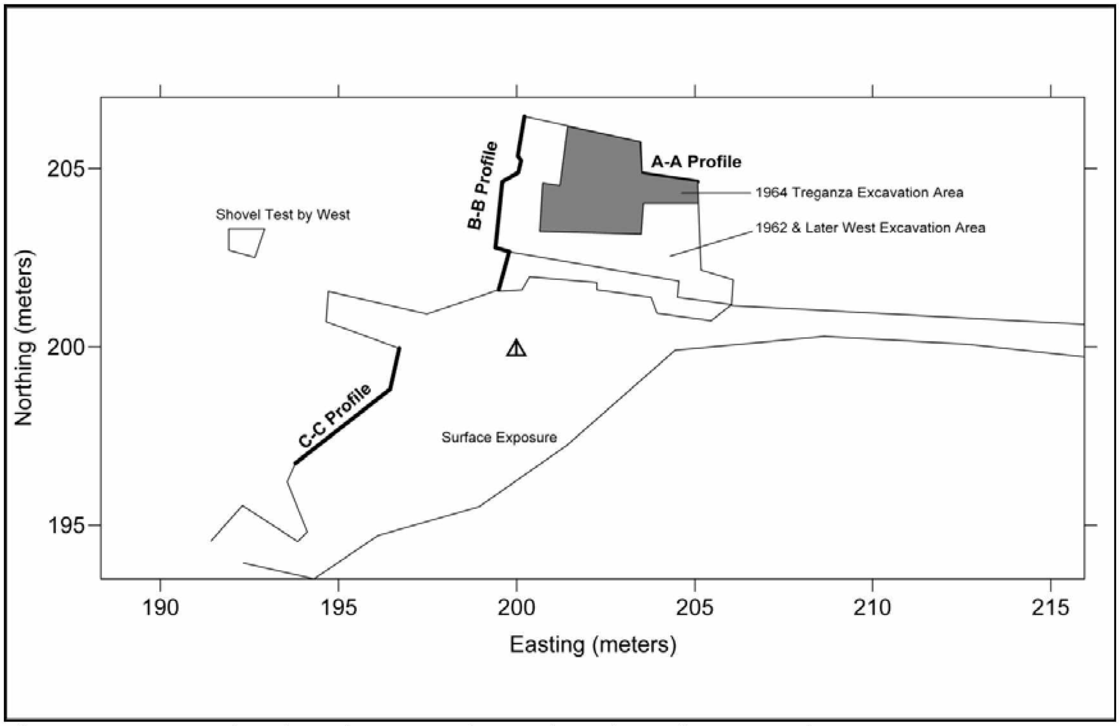

Figure 1.2. Map showing the approximate location of West and Treganza excavations. Profiles A, B, and C were cleaned, described, and drawn by Goebel 1992. Dateable materials were collected by Goebel (1992) from the A profile.

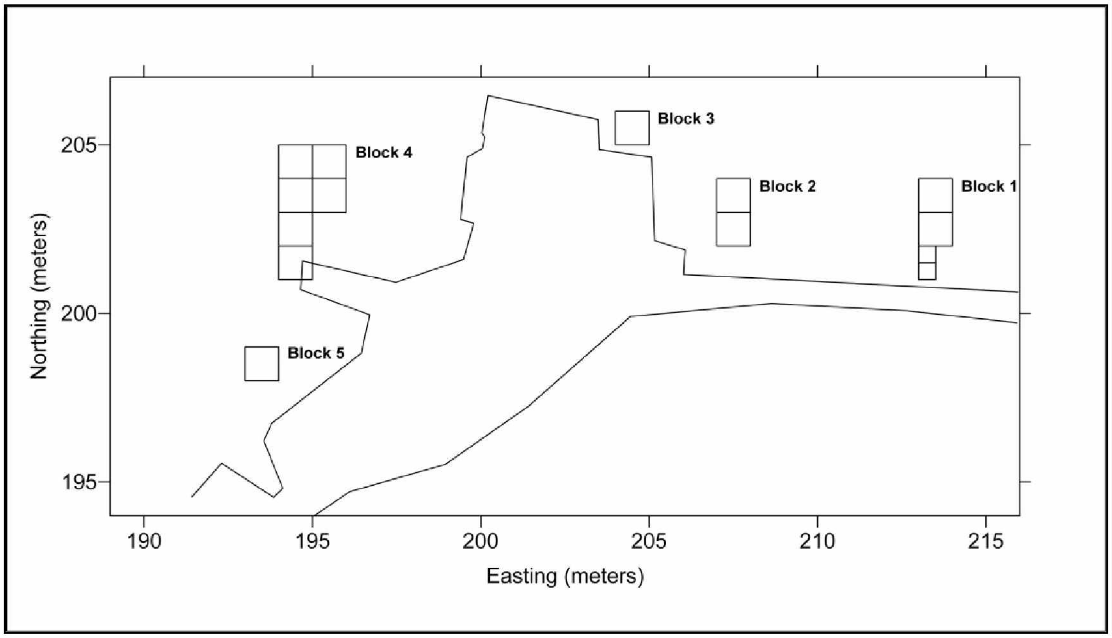

Figure 1.3. 2009 Excavation Block Locations

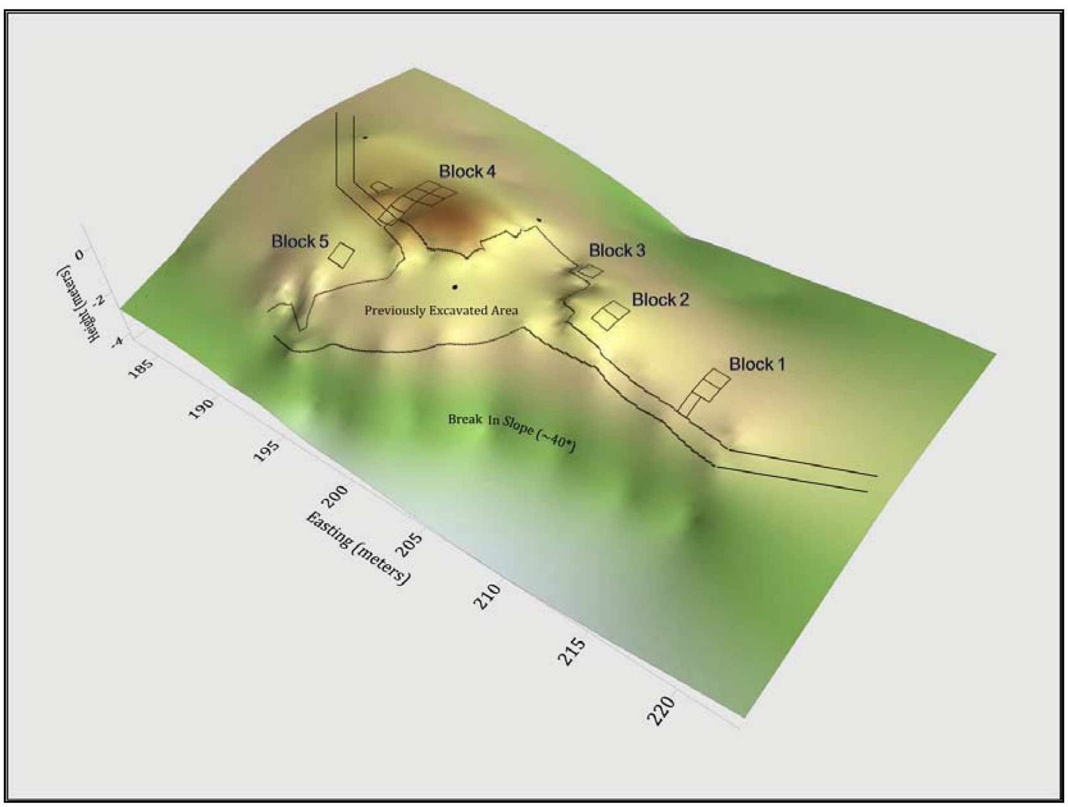

Figure 1.4. 2009 Block positions with datum locations.

Previous Interpretations of Teklanika West

Frederick H. West, the most extensive excavator of the site (1965, 1967, 1975, 1996), interpreted the site to having two cultural occupations. The first of these occurred under the root-mat at about 5-10 cm below the surface and the second occurring approximately 50 cm below the surface. The lower of these two occupations at the site is what West used in part to define the Denali culture complex. Unfortunately, this component remained undated. His second interpretation of the site was that it lacked cultural stratigraphy, yet acknowledged that there was natural stratigraphy due to forest fires in the area (West 1965:6). However, the relationship, if any, between the natural stratigraphy and artifacts remained unanswered.

A later investigation at the site in 1992, by Goebel (1992, 1996) identified three cultural components; the first, undated, occurred directly under the root-mat (O-horizon), the second associated with the B/Bw horizon ranging in age from 3310+/-100 B.P. (Beta-59591) to 5340+/-90 B.P. (GX-18517), and the last at around 7130+/-98 B.P. (GX-18518). The last date was obtained slightly below a paleosol within the loam horizon with associated cultural materials. While Goebel's work indicated that Teklanika West was multi-component, the nature and dating of these components remain unresolved, particularly because these dates were recovered from a single stratigraphic column and horizontal placement and association of artifacts was not accounted for. Despite the large amount of past field research (1960-1974) conducted at the site, there has been very little in-depth analysis and write-up regarding site formation, cultural materials, and site function.

Current ambiguities at Teklanika West still include understanding the number of components represented at the site, understanding the extent of post depositional disturbance, and intra-site variability occurring at the site. The disparate inconsistencies of the two main investigations summarized above (Goebel and West) reflect the lack of clear understanding of the site with respect to culture history and human adaptation in Alaska. Yet, despite these ambiguities, this site is important for its potential to contribute to the culture history of interior Alaska and to provide vital understanding of prehistoric hunter-gatherer adaptation during the late Pleistocene through late Holocene.

The Denali Complex was defined by Frederick H. West in 1967. West defined this new complex based on four artifact assemblages from central Alaska: Campus, Donnelly Ridge, Teklanika East, and Teklanika West. West noticed that the Denali complex shared similarities with the Dyuktai tradition seen in northeast Asia and concluded, largely based on geologic information and some radiocarbon dates from sites in northeast Asia, that the artifacts seen at these four sites and elsewhere in the interior of Alaska, must be at least 12,000-10,000 years old. However, the antiquity of West's type-sites for the complex was cast into doubt with subsequent revisits to either site. Three of the four sites originally used by

West to define the complex produced younger than expected dates.

Of the four type-sites used to define the Denali Complex, three were problematic with respect to age, context, and association of cultural materials. Mobley (1991) re-dated the Campus site (FAI-001) to the mid-Holocene, based on seven dates ranging from modern to about 3500 years ago. A mid-Holocene date seems probable, but there is uncertainty regarding the integrity and validity of these dates. Pearson and Powers (1999, 2001) proposed an early to mid-Holocene occupation for the site based on a new AMS date of 6850±70 (Beta-97212) B.P. The site probably represents multiple occupations with difficulties in ascertaining the ages of each occupation, such that all dates from the site should be taken with caution.

Dates derived from charcoal at Donnelly Ridge (XMH-005) yielded significantly younger ages than West expected (1790 ±300 (B-650) and 1830 ±200 (B-649)) (West 1967). These dates were rejected by West (1967) as being related to a tundra fire not dating or even representing the occupation of the site. However, some archaeologists do not reject these dates, given the clear evidence for later Holocene microblades in central Alaska (e.g. Shinkwin 1979; Potter 2008).

Teklanika East (HEA-002) was largely disregarded as a near surface with little sediment deposition and formal stratigraphy. The site remained undated until recent test excavations were conducted at the site in 2006. These excavations were conducted by the Alaska Office of History and Archaeology. Results of these excavations revealed that part of the site does indeed have stratigraphy with *in situ* cultural materials with charcoal stratigraphically associated to these materials (Coffman 2011; DePew et al. 2006). Charcoal, stratigraphically associated with the cultural materials, were collected during these tests and range in age from 6000 to 3000 B.P. Though these dates are not quite as old as West postulated, they do indicate that Teklanika East's earliest component dates to the Mid-Holocene and that portions of the site do contain buried cultural materials.

The last of West's type-sites, Teklanika West, has been researched over the last forty-years by various researchers. Each researcher who has excavated at the site has always concluded and interpreted the site differently. However, the consensus of all the investigators at the site remained the same; Teklanika West is culturally significant due to the artifact assemblage recovered. Unfortunately, the site lacked reliable dating making it difficult to assess significance and age of the site. Since West's original definition of the Denali complex in 1967, additional archaeological sites have been found and investigated. Many of these sites in part share artifacts similar to those used by West to define the complex. Dry Creek Component 2 has contributed the most in re-defining the complex. Dry Creek Component 2 provided a number of new terminal Pleistocene/early Holocene dates, something West's original type-sites were not able to do until the mid-1970s (cf. West 1975) when West dated materials from the Tangle Lakes region of Alaska. These sites, coupled with Component 2 at Dry Creek firmly dated the

Denali Complex to the late Pleistocene (Thorson and Hamilton 1977:166; Powers et al. 1983; Powers and Hoffecker 1989). Additionally, the artifact assemblage from this component yielded a large and diverse sample of artifacts, occupation floor patterns, and associated faunal remains, all of which have provided a better definition for the complex (Hoffecker et al. 1996). However, problems persist with understanding the relationship of this component to the underlying, older, component, along with a general understanding of Component 2. Thorson (2005) has shown the possibility of artifact mixing within both Components 1 and 2 based on landform variability and vertical movement of artifacts.

CHAPTER 2: SITE SETTING

Teklanika West lies in the upper Teklanika River Valley and is situated at an elevation of about 762 meters (2,500 ft.) above sea level (asl) with the adjacent mountains around the site rising from elevations of 919 to 1408 meters (3000-4500 ft.) asl. and tree-line at about 700 meters (2,300 ft.) asl in the area. Large game is locally and seasonally abundant in the area during different seasons. Charles Sheldon (1930:126-140) noted the large amount of caribou (*Rangifer tarantus*), Dall sheep (*Ovis dalli*), and moose (*Alces alces*) that could be found in the area during the spring and fall months. Though the number of these creatures has declined over the past century, due largely to market hunting (Walker 2005), the upper Teklanika River Valley today still acts as major migration routes for caribou, Dall sheep, moose, and wolves (*Canis lupus*). Caribou and sheep migration routes still exist in the area today and are seasonally used by these animals. These routes occur predominately to the east of the site, in the Sheep Pass area (Schimberg and Schledermann 1967; Treganza 1964).

Paleoecology for the area is based on lake cores from the Nenana River Valley and Broad Pass area. Vegetation of the area may be described as a mix of boreal forest inter-mixed low-lying tundra. Flora of the area consists mainly of white spruce (*Picea glauca*), alder (*Alnus*), willow shrub (*Salix*), and black spruce (*Picea mariana*). Berries are present in the area and include blueberry (*Vaccinium simulatum*) and crowberry (*Empetrum nigrum*).

Paleoecology of the northern foothills of the Alaska Range has been interpreted primarily through pollen and other macrofossil evidence from lake cores, including Eightmile Lake (Ager 1983; Bigelow 1991) and Windmill Lake (Bigelow and Edwards 2001). The paleoecology of the Nenana River Valley, closest to the study area (about 8 air miles) with a relatively similar environment, can be summed specifically by lake cores from Eightmile Lake (Ager 1983; Bigelow 1991). Pollen records from these cores seem to indicate the following: the herb zone from the earliest period indicates a time of cold and dry climate with some grasses, *Artemisia*, and tundra forbs (Bigelow 1991:10). The herb zone concludes at about 14,000 years ago in the Tanana Valley, but ends later in the Nenana Valley, at about 13,500 years ago. The herb zone is then followed by the *Betula* zone. Bigelow (1991:10) refers to this as the invasion of shrub birch. This zone is dominated by shrub birch pollen with low quantities of willow, grasses and *Artemisia*. By roughly 11,000 years ago *Populus* and willow became dominate in the area giving rise to the *Populus-Salix* zone (Bigelow 1991:10). The *Populus-Salix* zone lasts for approximately 3500 years before spruce, alder, and birch come into the region. Ager (1983:136) denotes this time as being the *Picea-Alnus-Betula* zone, beginning around 7500 years ago.

The Broad Pass area, south of Cantwell, Alaska has had some paleoecological reconstruction preformed. The most recent and applicable study to this region comes from Windmill Lake in Broad Pass from a study conducted by Bigelow and Edwards in 2001. In this study the authors define the Preboreal

Stage as being characterized by an initial spike in birch (*Betula*) and willow (*Salix*) followed by the decline of those species at the expense of aspen and cottonwood (*Populus*), and shrubs and herbs (*Artemisia*). This Preboreal stage lasts from about 11,100-9400 B.P. and was likely a productive environment (Bigelow and Edwards 2001). Shortly after 9400 B.P., the Boreal stage began. This was probably less productive than the Preboreal stage, such that productivity declined noticeably in the southcentral Alaska area (Wygal 2009a) as conditions became increasingly mesic at about 6000 B.P. with the intrusion of black spruce (*Picea mariana*) that expanded quickly across the region (Guthrie 1990). One ramification of black spruce emerging as the dominant flora species in the boreal forest is a consequential increase in the frequency and intensity of natural forest fires (Lynch et al. 2002). Today the ecology of Broad Pass and areas surrounding Teklanika West has changed little from 6000 B.P. Modern vegetation in the region consists primarily of a mixed black spruce, white spruce, and birch (*Picea* and *Betula*) forest, with low-lying sedge.

Paleoecological reconstruction from the Dry Creek and Walker Road sites seem to indicate that *Populus, Salix, and Betula* were present, particularly in well-drained areas, such as alluvial plains and maybe terrace fronts (Bigelow 1991:11). While in poorly drained areas, it is possible that sedges, grasses, and herbaceous tundra were dominating (Bigelow 1991:11). *Populus* woodlands were probably restricted to the protected valleys with upland settings being covered by tall birch and willow shrub (Bigelow 1991:11).

Each of these varying ecological zones had varying impacts upon how humans may have lived. Bigelow and Powers (2001) discuss ways in which these zones affected humans. The Herb Zone (Bigelow 1991) began around 14,000 cal B.P. that coincides with increase warming and effective moisture in central Alaska (Bigelow and Powers 2001; Hoffecker and Elias 2007), humans also begin to migrate into Eastern Beringia during this time. The *Betula* zone follows this and corresponds to the onset of the Younger Dryas event. Bigelow and Powers (2001) discuss that this event likely had very little effect on the both the vegetation of interior Alaska and virtually no effect on humans. The end of the Pleistocene and the onset of the Holocene, which saw gradual warming, seem to have disrupted human occupation the most in interior Alaska. This time period is marked by a decrease in the number of sites and could have affected animal resources in the region. Changes in diet and possibly technology occur during the early-mid Holocene period (cf. Potter 2008).

The quaternary fauna of central Alaska has been studied extensively (Guthrie 1990). The Dry Creek site, lying about 35 miles northeast of Teklanika West offered a chance to document late Pleistocene faunal remains in clear association with cultural artifacts (Guthrie 1983b). Based on faunal from Dry Creek we know steppe bison (*Bison priscus*) lived in the area around the central Alaska Range (Guthrie 1983b; Hoffecker et al. 1996), as did Dall sheep and wapiti (*Cervus canadensis*), of which Dall sheep are still living in the area today. Aside from Dry Creek and Teklanika West, five other sites offered insight into the use of upland resources. Table 2.1 shows the presence and absence of faunal remains recovered from these sites. Dall sheep dominate these sites' faunal assemblages along with caribou. Along with Teklanika West, Dry Creek components one and two are the only sites which contain extinct faunal remains.

Table 2.1. Presence/absence of faunal remains from Nenana River sites. *Dry Creek Component 3/4 contains unidentifiable faunal materials.

Site (Component)	Wapiti/Elk *(Cervus canadensis)*	Bison *(Bison* sp.)	Caribou (*Rangifer tarandus)*	Dall Sheep *(Ovis dalli)*	Black Bear *(Ursus americanus)*	Arctic Ground Squirrel *(Spermophilus parryii)*
Carlo Creek (C1) (Bowers 1988)			+	+		+
Dry Creek* (C1) (Powers et al. 1983)		+		+		
Dry Creek* (C2) (Powers et al. 1983)	+			+		
Nenana Gorge (Plaskett 1977)			+	+	+	

Geology

The surficial geology of the area is dominated by aeolian-deposited sediments (Nye 1978). It is likely most of these sediments were deposited during or shortly after glacial conditions in the region. Wahrhaftig (1958) defined the glacial history of the region. Most extensive of these glaciations occurred over 70,000 years ago and was known as the Healy Glaciation. During this glaciation, glaciers advanced to roughly the outer range of the Alaska Range. The second largest advance by glaciers was during the Riley Creek Glaciation. This glaciation lasted from about 25,000-9500 years (Dortch 2006; Wahrhaftig 1958) (Figure 2.1). Unfortunately, there has not been much work conducted to determine to when the Upper Teklanika River Valley was essentially deglaciated. Dortch (2006) estimates the end of the Riley Creek Glaciation in Carlo Creek area to have ended at about 9500 years ago. This research has indicated, the Upper Teklanika River Valley was ice-free by ~11,000 years ago. However, future geologic research in the area should address the issue of when deglaciation started and how long it took. The radiocarbon and archaeological evidence supports the idea for an early deglaciation. As it stands right now, Teklanika West is the earliest firmly dated archaeological site in the Upper Teklanika River Valley at about 11,000 years old. The Owl Ridge site situated about 30 kilometers (20 miles) north of the site, just outside the Teklanika River Canyon area of Denali National Park, is dated to about 11,300 B.P. years old and is similar to sites in the Nenana River Valley. The presence of humans in the foothills of the Alaska Range from about 11,000-10,000 years ago suggests that conditions in these upper river valleys, valleys nearest the Alaska Range, were ice-free and hospitable for humans and animals alike. This notion is further elaborated on and supported herein.

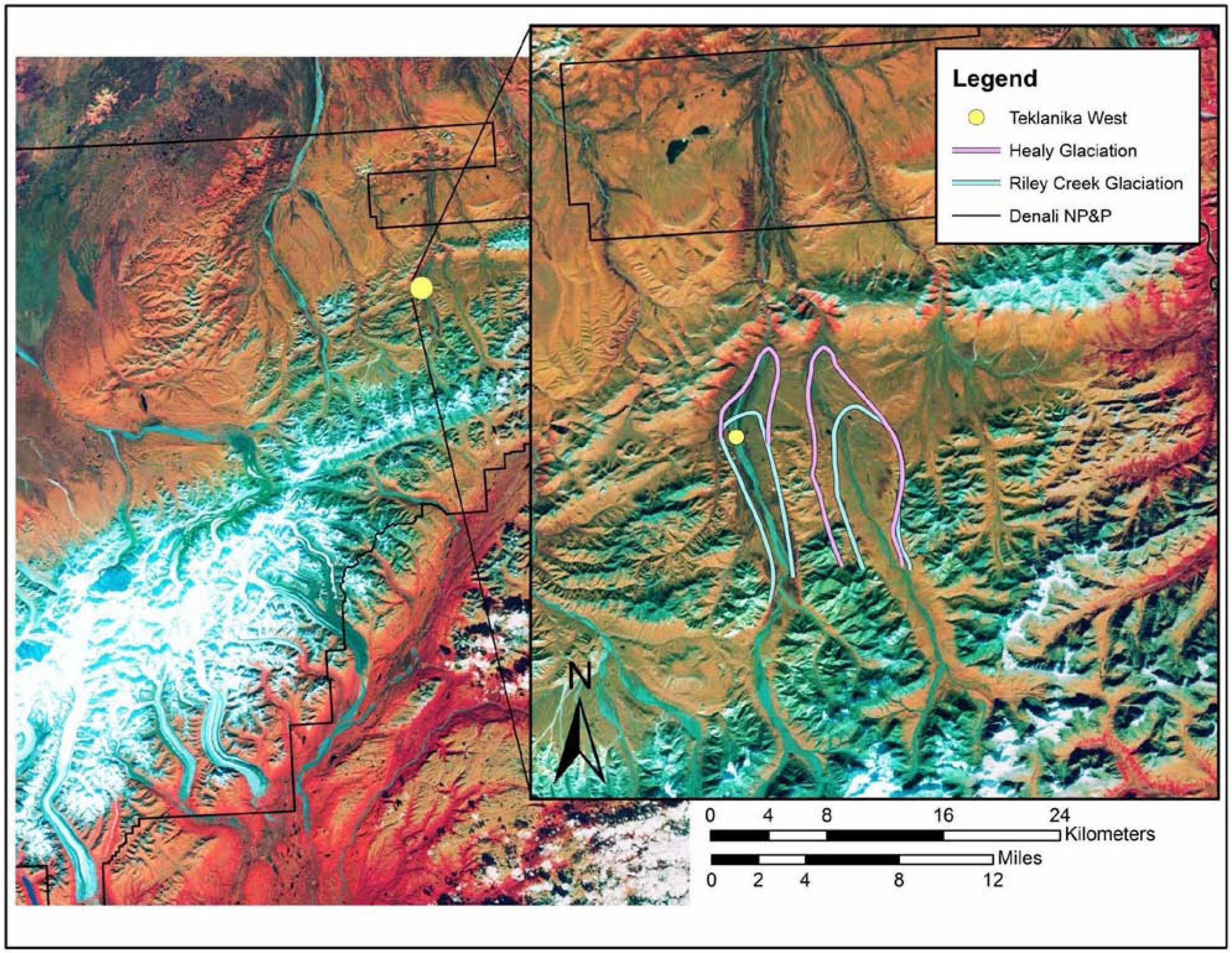

Figure 2.1. Glacial history of the Upper Teklanika River Valley. After Wahrhaftig 1958; Dortch 2006. (GIS basemap data from the National Park Service 2003).

CHAPTER 3: REGIONAL CULTURAL CHRONOLOGY

Prior to the 1930s, the link between people migrating across Beringia was speculative. Resolution to this problem came, to a degree, with the discovery of the Campus site at the University of Alaska Fairbanks. Nels Nelson and Froelich Rainey excavated at this site and reported on the strong similarities the Campus artifacts shared with those recovered from Paleolithic sites in central Asia (Nelson 1937; Rainey 1940; Lynch 1996). Most importantly of these artifacts were the wedge-shaped microblade cores and microblades establishing the first linkage between Asia and North America. Years later, research in the Tanana Valley subsequently produced another Campus-like microcore site, Dixthada along Mansfield Lake. This site showed two occupational components; one of these was clearly Athabascan and the other underlying component was the Campus-like microblade occupation (Rainey 1939, 1940). Successive research in the area continued to produce archaeological sites all sharing these characteristics: microblades and microblade cores.

Denali Complex (~10,700-7000 B.P.)

Some resolution came in the mid-late 1960s with an attempt to establish a cultural chronology and make some sense out of the variation in lithic assemblages. Frederick H. West in 1967 defined the Denali Complex based on artifacts from interior Alaska. West's (1967) main definition of the complex was that it occurred primarily in central Alaska and consisted of wedge-shaped microblade cores, Donnelly burins (those burins produced on flakes), microblades, and biconvex bifacial knives (West 1967, 1981). The complex definition was based on four artifact assemblages from central Alaska: Campus, Donelly Ridge, Teklanika East and Teklanika West, with Teklanika West becoming the type-site for the complex, based on the similarities those artifact recovered at the site shared with Old World site assemblages from Mongolia, Russia, and China. Moreover, West concluded the Denali Complex should have substantial antiquity, at least 10,000 years old if not older (West 1967, 1981).

Since the definition of Denali, additional Denali-like sites have been found in the Nenana Valley as well as throughout eastern Beringia. Sites ascribed to the Denali Complex now have an age range of approximately 10,700-7000 B.P. (Hamilton and Goebel 1999) similar to what Frederick West originally thought.

The origin of the Denali Complex likely has its roots in the Upper Paleolithic Dyuktai Culture of Siberia and the Russian Far East (Holmes 2001; Hoffecker and Elias 2007). Both of these lithic industries seem to represent a similar, although rapidly evolving postglacial, northern interior economy (Yesner 2001). The Dyuktai Culture is a microblade bearing culture that appears approximately 18,000-15,000 B.P. and lasted until about 10,000 B.P. (Mochonov 1977; see also Goebel 2004), despite argues by others for greater antiquity, possibly 35,000 B.P., for the Dyuktai culture (e.g. Mochonov 1977, 1978; Kuzmin 2004). The fact of the matter is that a late age for Dyuktai as proposed by Goebel (2004), fits the archaeological record. It would take time for humans to re-colonize the Russian Far East after the Last Glacial Maximum (LGM) and migrate eastward into Alaska and the New World. This notion is further supported by recent research at Swan Point Culture Zone 1 (Holmes 2001). Artifacts from this level contain many similarities technologically to that of Dyuktai Culture (Holmes 2001), further establishing and reiterating the link between migrating populations of the Old and New Worlds. The Dyuktai Culture seems to fade out of the archaeological record at ~11,000-10,000 B.P. and is replaced by the Sumnagin culture (Mochonov 1969; Mochonov and Fedoseeva 1984), whereas in Eastern Beringia, microblade technology is common with move variation in core forms (Powers and Hoffecker 1989).

Microblade Technology

Microblade technology may have played a key role for early hunter-gatherers to colonize and adapt to higher latitudes (Elston and Brantingham 2002; Goebel 1999, 2002; Guthrie 1983a; Hoffecker 2005; Yesner and Pearson 2002:134). It was an extremely efficient use of high-quality stone that generated the maximum amount of usable edge while minimizing the quantity of stone that must be gathered and carried around (Hoffecker 2005:111). Microblades, by definition are typically no more than 2 cm long and 1 cm wide (Goebel 1999:218; Sanger 1968). They, like large blades, have dorsal ridges or facet scars, remnants of blades that were previously removed (Goebel et al. 2000:567; Morlan 1976).

However, there appears to be no universal dividing point between microblades and blades based on width or other measurements of size (Cook 1975; Owen 1988; Sanger 1968), however Taylor (1962) argued for about 12mm cut off point. This is also hindered by the often-large number of fragmented blades and microblades in a particular assemblage (Owen 1988:2). One main difference between blades and microblades is that microblades were deliberately manufactured for hafting into composite tools (Goebel 1999:218; Kuhn and Elston 2002:105; Guthrie 1983a; Knecht 1997). This aspect is reflected by the product's small size and standardized form (Kuhn and Elston 2002:2), but also by the recovery of slotted bone and antler points from early sites in Siberia and Alaska (Ackerman 1994; Dixon 1999; Hoffecker 2005).

The Denali Complex lasts until about 6-7000 B.P. (Dixon 1985; Hamilton and Goebel 1999; Potter 2008). It is unclear as to what happens thereafter. Microblades are still present in the archaeological record (cf. Potter 2008), however notched points (Dixon 1985) and other technological tool-kits enter the archaeological record.

Nenana Complex (~11,300-11,000 B.P.)

The Nenana Complex currently remains ambiguous. It may represent one of the oldest cultural complexes in eastern Beringia. It bears some similarities to the Chindadn Complex, as defined by Cook in 1969, based on the artifact assemblage from the Healy Lake Village site. This assemblage contained teardrop shaped point-like artifacts, microblades, and end scrapers. In contrast, artifacts recovered from Nenana Valley sites shared similarities to the Chindadn Complex, yet microblades were absent from those site assemblages.

This distinction led Powers and Hoffecker (1989) to define the Nenana Complex based on artifact assemblages from Dry Creek Component 1 and Walker Road Component 1. Goebel et al. (1991) and Goebel & Pontti (1991) all contributed to the definition of the complex. The Nenana Complex now incorporates all of the following; it is a core and blade technology, which lacks microblades and microblade technology. Endscrapers are present within Nenana assemblages, but the most characteristic and defining artifact of this complex is the Chindadn points, a teardrop to sub-triangular point. Age ranges for the Nenana Complex are approximately 11,300-11,000 B.P. (Hamilton & Goebel 1999; Holmes 2001).

Origins of the Nenana Complex remain uncertain. The projectile points, if that is what they are, form the main definition of the complex, in addition to the lack of microblades. Allegedly, these points were manufactured through bifacial reduction of cobbles or flakes (Dikov 1996), a technique that Dikov thought made a strong correlation to many Upper Paleolithic lithic technologies. However, most bifaces are typically reduced from cobbles and/or flakes and many lithic industries throughout the world manufacture bifaces in a similar fashion. In my opinion, this does not hold any influence. Yet, if we agree with Dikov, then

Nenana has ties to Siberian lithic industries.

Since the complex lacks microblades some have viewed Nenana as a representing possible Clovis progenitor (e.g. Goebel et al. 1991; Goebel 2004). This possible link between the two is based on phylogenetic relationships. Such that, as Clovis lacks microblades, like Nenana, and has a similar amount of end scrapers those two share more similarities to each other as opposed to Clovis and Denali. Buchanan and Collard (2008) have argued for the reverse, with Clovis and Denali being more similar as compared to Clovis and Nenana. This information is important, but different lithic tool classes may be over represented based on site activities, length of stay at the site, proximity to raw material sources, and additional factors that were not considered. Additionally, there is a great deal of variability represented within each lithic assemblage.

Furthermore, temporally placed, the Nenana Complex corresponds slightly to the beginning of Clovis in low latitude North America (Waters and Stafford 2007). It would be difficult for hunter-gatherers living in eastern Beringia to start Clovis. This is not taking into consideration whether or not the ice-free corridor would be open during this time period, as well as ease or lack thereof of movement through the corridor. Less phylogenetic research should be performed to contribute to our understanding of the possible relationships, if any; Nenana and/or Denali may share to Clovis and other lower latitude Paleoindian Traditions.

As for the Denali Complex, it seems it has origins in the Dyuktai Tradition of Siberia and the Russian Far East. Albeit the Denali Complex ends at approximately 7000 B.P., microblades continue to persist and thrive in the sub-arctic region for at least another 4000-5000 years. Nonetheless, both the Denali and Nenana Complexes of eastern Beringia, share affinities to Upper Paleolithic technologies in Siberia. Decedents of those individuals found at the Kostenki and Sunghir' burials most certainly migrated northeastward colonizing uncharted landscapes and ultimately Beringia, and the Americas.

The second alternative view of these two complexes is that they are nothing more than seasonal variations in tool assemblages of each other. A view proposed by Powers and Hoffecker (1989), West (1996), Gal (2002), Holmes (2004), and expanded upon by Potter (2008, 2011) and Wygal (2009a, 2009b). In each of these scenarios, the Nenana Complex represents more of an upland landuse strategy during the late spring and summer months when toolstone is plentiful and animals such as caribou and Dall sheep can be exploited. Whereas the Denali Complex is more confined to lowland settings during fall and winter months when toolstone is in demand and animals have migrated to lower elevations. The two competing ideas need to be tested with both ethnographic data as well as meet certain expectations within the artifact assemblage.

Northern Archaic Tradition

The Northern Archaic Tradition still remains as ambiguous as when it was originally defined by Douglas Anderson in 1968. Artifact assemblages typical of the Northern Archaic was seen by a number of archaeologists (Irving 1953; Anderson 1968) as being different from those artifact assemblages found along the northwest coast of Alaska, yet share many similarities to artifacts found in the Interior Alaska, subarctic Canada, and further south (lower latitude North America) (Anderson 1988:87).

Lithic technology commonly associated with Northern Archaic assemblages, included end-scrapers, lanceolate, straight based, and notched projectile points, microblades, microblade cores, and burins (Workman 1978). In its simplest form, the Northern Archaic essentially encompasses the majority of tool classes of early lithic technologies, with the exception of notched cobbles, semi-lunar biface knives, and notched points. This begs the question, just what defines the Northern Archaic? Definitions exist, however they are too vague and seem to incorporate tool classes that are present in earlier and later lithic technologies.

Equally as vague is the origins of the Northern Archaic and whether or not it represents an entirely new culture migrating northward, or if it represents diffusion of a technology. Workman (1978) has been a proponent of population replacement in which he proposed a route for Northern Archaic groups that started in the south and gradually migrated north through Canada and ultimately into almost all part of Alaska. Morrison (1987) explained the Northern Archaic

Tradition as resulting from diffusion of notched projectile points from south to north. Julie Esdale (2008) argues for the latter, that Northern Archaic represents a separate cultural tradition in the region, with an emphasis towards interior-terrestrial subsistence practices. The basis of this argument is based on the hiatus event at Onion Portage, which serves as the bracketing event for American Paleoarctic (Denali) and Northern Archaic. This may be the case yet it is a single site with problems regarding site stratigraphy and dating of the older components at the site (Hamilton and Goebel 1999:178).

Athabascan Tradition

The Athabascan tradition in central Alaska began around 1500 years ago. It is marked by a shift towards bow and arrow technology with the reliance on bone and antler tools, decorative items (beads and buttons) boulder spall scrapers, fleshers, and other more elaborate objects (Cook 1975; Dixon 1985; Potter 2008). Traditional Athabascan lifeways were quite complex. Traditional settlement patterns consisted of winter villages with well-built multi-family structures near major rivers and tributaries, and temporary camps that served as bases for various subsistence tasks, i.e. hunting, fishing, and fish processing. Many of these camps were reoccupied year after year (Workman 1976; Griffin 1990). Moreover, caching behavior became more common during the Athabascan period.

Trade networks also developed, possibly because of expanding population after 1,000 B.P. (Cook 1975; Griffin 1990). Materials being traded among these networks consisted of obsidian, copper, and other prestigious items.

Traditionally, five Athabascan groups occupied the land now encompassing what is now Denali National Park and Preserve. These groups included the following: the Ahtna, Denai'na, Lower Tanana, Upper Kuskokwim, and the Koyukon. Of these, the Lower Tanana Athabascan language and culture groups encompassed the upper Teklanika River valley.

Athabascan seasonal activities around Denali were closely aligned to the abundance and migration patterns of game, which formed the primary mode of subsistence among Athabascan groups in subarctic Alaska. The Athabascan economy, prior to direct contact with Europeans, was based on a cyclical pattern of hunting, fishing, gathering, and trade (Simeone 1982, see also Collins 2004; Gudgel-Holmes 1989; Ives 1990; Shinkwin 1979; VanStone 1974). These seasonal rounds or resource scheduling patterns, varied from group to group often depending upon the availability of natural resources (VanStone 1974), yet the primary goal of Alaskan Athabascans was to obtain enough resources to last them throughout the winter months and to avoid disaster (Clark 1974).

In some years the caribou, migratory fish, birds, and other game may have migrated earlier or later than in others, or not at all. Thus, in the Athabascan subsistence economy, activities varied seasonally, annually, and geographically (Clark 1974). Moreover, some groups, such as the Dena'ina (De Laguna 1934; Kari and Fall 2003; Townsend 1981), the Han (Crow and Obley 1981; Mishler and Simeone 2004), Koyukon (McFadyen-Clark 1981; Gudgel-Holmes 1989; Holmes 1977, 1984, 1986), and the Upper Kuskokwim (Collins 2004; Hosley 1981) there have been considerably more intense study of their seasonal movement, landscape use, and settlement. On the other hand, the Ahtna, (Skeete 2008:9) for example have had far less. This has led anthropologists to use landuse and seasonal round-based knowledge from other Athabascan groups as a proxy to understand not only Athabascan groups in general, but also the prehistoric lifeways of hunter-gatherers in the subarctic.

Provided is a general overview of ethnographically known Alaskan Athabascan subsistence and settlement strategies. Understanding the ethnographical information provides an analogy to help better understand the past. Due to the vast size of interior Alaska and the various different physiographic features and subdivisions of the subarctic, not all Athabascan groups practiced essentially “the same” seasonal round. In this case, I try to emphasize this with specific examples. However, a general Athabascan seasonal round was conditioned by the landscape and the availability of different resources throughout the year.

The majority of Athabascans were semi-nomadic hunter-gatherers who moved seasonally within defined territories to harvest fish, large animals, and other natural resources. Although the search for these resources was ongoing throughout the year, specific resources were more abundant for short periods at certain times of the year. Consequently, failure to secure at these specific times of the year may jeopardize the food security of the band during the long winter and early spring months (Skeete 2008).

The winter months were spent in a location that could provide the group at least one secure resource, such as muskrat, hare, or other small mammals (Gudgel-Holmes 1989). Shelters were more permanent, often consisting of semi-subterranean houses with some form of an arctic entry (Allen 1900; Clark 1974; De Laguna and McClellan 1981; Gudgel-Holmes 1989; VanStone 1974). Most winter sites were situated along lakes, tributaries, or major streams. These streams were generally not along major silty or glacial rivers (Hosley 1966:95). Hunting and fishing took a greater importance during these months. Fur bearing animals, such as beaver and muskrat, were trapped during these months. Hosley noted (1966:92) that beaver were an important resource for the Kolchan and Upper Tanana during the winter months. Moreover, McKennan (1965:32) notes that the Kutchin hunted sheep during the winter too, but only when other game was scarce and in need of. For most other Athabascan groups, the hunting of caribou, moose, and the occasional hibernating bear was done during the winter too, when possible. Usually everyone participated in the quest for food during the winter months (Clark 1974). Fish were caught through the ice by the Kolchan, Upper Tanana, and the Kutchin (Gudgel-Holmes 1989). Fishing during these months were caught by using a variety of tools, such as fish spears, fish lures, bone hooks, traps, and nets set under the ice (Clark 1974). This often continued until the ice became too thick. An important aspect is that Athabascans often mapped onto locations on the landscape that did not freeze over during winter months. This means these locations were vital to both humans and animals to obtain resources year-round, in essence, these locations reliable. Gudgel-Holmes (1989:19-20) has documented several of these locations around Denali and has noted their importance, as they would have been attractive areas on the landscape for animals to congregate. These open water spots would have been ideal for fish, waterfowl, and animals, which could ultimately provide subsistence resources for groups already stressed by the winter. Unfortunately, no locations like this exist around Teklanika West. Importantly too note, throughout the whole year wood for fires and building would be continually collected or noted for its location. In fact, firewood was probably the most important single material collected by the people (Simeone 1982).

Late winter and early spring were considered some of the most difficult times for Alaskan Athabascans because cached supplies had all but diminished and game was scarce to find (Gudgel-Holmes 1989; Simeone 1982). Typically, bands were still congregated together in winter villages. The coming of late spring saw the thawing of lakes and rivers, allowing most Athabascan groups to begin moving to areas to start fishing, while pursuing other forms of game (i.e. caribou and waterfowl). Woman and children would typically stay in lowlands to continue fishing and to snare small game and waterfowl. Fish were mainly filleted by women and stored in the ground or in covered birch-bark containers to be saved for later in the year. Likewise, groups of men would begin moving into the uplands to capture the migrating caribou herds returning from the lowlands. This is seen archaeologically at sites such as Gulkana 077, where the site likely served as a late winter/early spring beaver hunting camp and cache site (Workman 1976). Klo-Kut (Morlan 1973) and Rat Indian Creek (Le Blanc 1984), on the other hand, contained very well preserved faunal assemblages of caribou and low numbers of moose specimens, and likely served as spring caribou hunting camps in the foothills. Gudgel-Holmes notes (1989:23) that in earlier prehistoric times, the spring caribou hunt would not allow for such lengthy spring camps and that perhaps the band would split into groups. One would be for hunting, and the other for as she describes it "springing", where women and children could continue to fish and hunt beaver and muskrat. This however, does not seem to be the case with the Upper Tanana, where they restricted their fishing to the late spring and early summer to capture runs of whitefish. Usually by mid-July the fishing was over and the Upper Tanana would all move to the foothills of the Alaska Range to intercept the late summer migration of caribou (Simeone 1982). On the other hand, the Han and Ingalik peoples would spend considerably more time fishing for either whitefish or salmonoid resources. Late spring and spring structures almost explicitly consisted of teepee or teepee-like structures, like lean-tos and the like. The most common technology during these months was the bow and arrow, in addition to some spear use. Spring was also a time when both men and women would collect bark from trees for use in constructing canoes, baskets, in some instances, the roof and walls of their winter houses, and for fish drying racks, and sheds (Clark 1974).

The short summer season saw several important activities occurring simultaneously. Caribou and other large game played more important roles for groups (like Gwich'in and Upper Tanana) who relied less on salmon. During the summer, when caribou had migrated to the uplands of the Alaska and Brooks Ranges, it would not be uncommon for these Athabascan groups to spend the whole season there hunting and drying the meat of not only caribou, but as well as sheep, and occasionally bear (Gudgel-Holmes 1989; McKennan 1981; Simeone 1982; Slobodin 1981). Yet, the majority of the other Athabascan groups would return from their upland spring camps and move to larger rivers and lakes where they could establish their summer camps, typically occurring in most northern region around mid-late June (Clark 1974). It is thought that sites representing a possible summer or winter occupation would include Dixthada (Shinkwin 1979), located along Mansfield Creek and Dakah de'nin (Shinkwin 1979; VanStone 1955). These camps, in terms of structures, varied greatly from group to group. Most consisted of lean-tos to moss-covered tent-like structures (McFadyen-Clark 1981; Slobodin 1981). An interesting aspect to Athabascan site organization and structure is that there were few, if any, hearths located indoors during the summer months and cooking was done almost explicitly outdoors (Clark 1974:26).

Generally, the early to late summer technology of Athabascan groups consisted of fishnets, net sinkers, spears, and fishing hooks made of bone. Technology all geared towards the procuring of large amounts of salmon. During this time, it is important to note that not all Athabascan groups stayed along the salmon bearing rivers. If salmon runs were scant, men would often return to the uplands to continue the hunting of caribou and sheep, leaving women to continue fishing and hunting/trapping small mammals. Sheep hunting would also occur in the summer along with the hunting of other large game when encountered. The Kolchan, for example, hunted caribou and sheep during the summer in the hills (Hosley 1966:99). The Upper Tanana primarily hunted sheep during the summer and fall after moose season to secure sheepskins for winter (Gudgel-Holmes 1989:19), however, interestingly, McKennan thinks this did not contribute much to their diet (1965:34-46). In the late summer, women and children picked a variety of berries while also digging up roots, which would be mixed with grease and stored in birch bark containers for the winter (Simeone 1982).

The autumn season saw the congregating of Athabascan groups. These groups then proceeded to move back up into the uplands where caribou and other large mammal species would be hunted. This was a time when caribou would be migrating back to the lowland areas for the winter months. Simeone (1982:10) notes this was a good time to secure fawn caribou skins, the best to produce winter clothing. The timing of these migrations varied from area to area with some migrations occurring in August in the Kutchin region, and in others, November for the Upper Tanana groups (McKennan 1959:47, 1965:31). Murie observed firsthand the variability in the Denali herds, beginning to migrate either in mid-late August or on occasion being postponed until October (1944:146).

Prior to the introduction of firearms, migration hunts usually required a communal effort and the use of corrals or fences (Hosley 1966:104). McKennan believed that nearly all Athabascans used some form of a hunting fence (McKennan 1965:47). Some fences extended for miles, with corrals being as large as a mile in diameter (Hosley 1966:98; McKennan 1965:31). It is generally assumed and agreed upon that most Athabascan groups hunted communally, with or without the aid of a driveline or fence. The weapons technology that accompanied these hunting parties was again bow and arrow technology, supplemented with additional tools and necessities. The large amounts of these tools were composed of bone and/or antler. Their camps consisted primarily of lean-tos or teepee like structures.

By late fall, groups were beginning to move back into the lowlands concentrating most of their effort now on procuring small game resources. Groups, if they already had not done so, would be congregating together and moving back to their winter villages, consisting of semi-subterranean houses.

Based on the preceding information, a general summarization of Athabascan subsistence may be put as follows: the use of the environment and landscape required that Athabascans know where and when game and plants were available. During winter months, November through March, Athabascan groups would be settled down in their winter villages. Generally considered a time of resource scarcity, Athabascan groups often had supplies cached to get them through the winter. More often than not, groups were not necessarily limited to their cached supplies, ice fishing occurred along with the hunting of small mammals and ptarmigan.

Late winter/early spring was considered a time of great hardship. Often, a group's cached resources were nearly, if not, depleted. Breakup in late April early-mid May allowed for the opportunity to do more fishing, while continuing to hunt small game. Additionally, late spring/early summer saw groups move to the uplands to hunt migrating caribou and other large mammals. This movement is often characterized by bow and arrow technology with the use of teepee-like structures.

Summer time was busy for Athabascans. Most groups returned to the lowlands to acquire spawning salmon and other fish resources. During this time, different forms of technology would have been employed, consisting primarily of fishing spears, nets, net sinkers, and fishing hooks. Yet, if runs were poor, hunting parties would return to the uplands to continue hunting Dall sheep and caribou, leaving women and children to continue fishing and gathering berries and roots. Late summer/early fall can be characterized as a time of increased hunting of large mammals along with the continued catching of salmon/fish. There tends to be a shift in the types of structures, lean-tos, being used during these seasons.

Bow and arrow technology continue to be the primary weapons used.

Lastly, autumn was a time of preparation. Athabascan groups were preparing for the looming winter season, while still trying to procure additional resources such as caribou, moose, and sheep. Late fall would see the groups move back to winter villages and congregate together. Thereafter, until spring of the next year, groups largely depended on local resources near their winter villages.

In summation, Athabascan subsistence strategies were not necessarily complex in regards to resource processing, i.e. acorns, nut, and seeds (cf. Fowler 1986), but rather more logistically complex, in the sense of remembering where, when, and how resources should be secured and processed. Most importantly, Athabascan groups needed to be aware of where and when seasonal resources would become available. If they did not have this local knowledge of the landscape and of its resources, a group's survival would most certainly be threatened.

Specific Athabascan Seasonal Round

The Athabascan subsistence pattern changed from around 1890 to 1930 around Mount McKinley/Denali. Trapping became more important in order to accommodate the purchase of trade goods and other committees (Gudgel-Holmes 1989:15). Hunting became more restricted around the central Alaska Range after

1917, with the creation McKinley Park. The ethnographic record supports this, as Abbie Joseph's stories about annual caribou and sheep hunting trips "high in the mountains" ended just before 1920 (Gudgel-Holmes 1989:15). This may be the result of two things: spring hunting in the mountains was restricted, or the void was filled by an increase in fur trapping that was especially lucrative in the 1920s.

The seasonal cycle for the Minchumina-Birch Creek-Bearpaw band is reconstructed from Abbie Joseph's accounts for the period around 1900. Her information is the closest to providing direct evidence of use within the project area in early historic times.

There is evidence that large game played a major role in subsistence activities. Fishing was a secondary activity among many Athabascans during the summer months and before the coming of the fishwheel (Figure 3.1 and Table 3.1). Salmon were not available to the Kutchin or the Upper Tanana. Yet, several runs of salmon spawned in tributaries of the Kantishna River. Gudgel-Holmes notes (1989:16) this provided inhabitants a rich, albeit ancillary, resource substantiated through oral accounts.

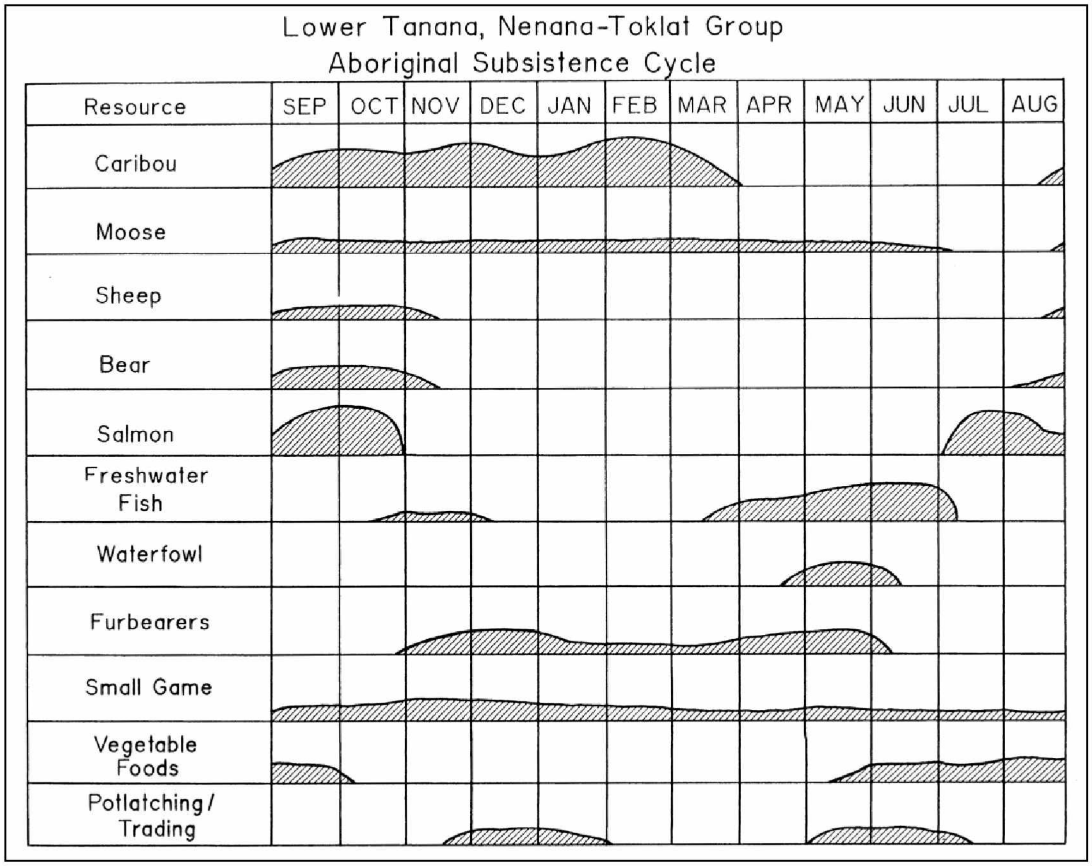

Figure 3.1. Lower Tanana Seasonal Round. Figure from Griffin 1990, Figure 11 page 288.

Table 3.1. Athabascan seasonal round, showing the resources, structures, and technology being used at different seasons.

Season	Population	Location	Resource	Structures	Technology
Early Winter	Grouping together	Lowlands around lakes or rivers	Small animals	Semi-subterranean house	Bow and arrow
Winter	Small bands	Lowlands around lakes or rivers	Small animals	Semi-subterranean house	Bow and arrow
Early Spring	Bands still together	Uplands	Caribou/Sheep	Teepee	Bow and arrow
Spring	Family units	Lowlands	Fish	Teepee	Bow and arrow
Early Summer	Family units	Rivers	Fish	Teepee/lean tos	Fish nets, spears, sinkers
Summer	Family units	Rivers	Fish	Lean tos	fish nets, spears, sinkers
Early Fall	Hunting parties	Uplands	Caribou/Sheep	Lean tos	Bow and arrow
Fall	Bands together	Move lowland	Small game	Near winter village	Bow and arrow

Summer

The summer was a busy season with several important activities occurring simultaneously. During the summer, when caribou were in the central park region, Minchumina-Birch Creek-Bearpaw members might spend the whole season there hunting and drying the meat of caribou, sheep, and occasionally bear (Gudgel-Holmes 1989:16).

Fall

Caribou were hunted during their migrations during the fall and spring (Figures 3.1 and 3.2 and Table 3.1). The timing of these migrations varied from area to area with some migrations occurring in August in the Kutchin region, and in November for the Upper Tanana groups (McKennan 1965:31, 1959:47).

Based on the ethnographic information we would then expect to find rather ephemeral camps representing for the seasons of spring through early fall. In contrast to this, we would expect to see more permanent semi-subterranean structures for the winter months in the lowlands. Additionally, depending on the type of structure recovered as well as its location we might be able to understand the type of resource, which was being procured, based on the ethnographic information. In sum, the ethnographic information acts as a way to help interpret the past.

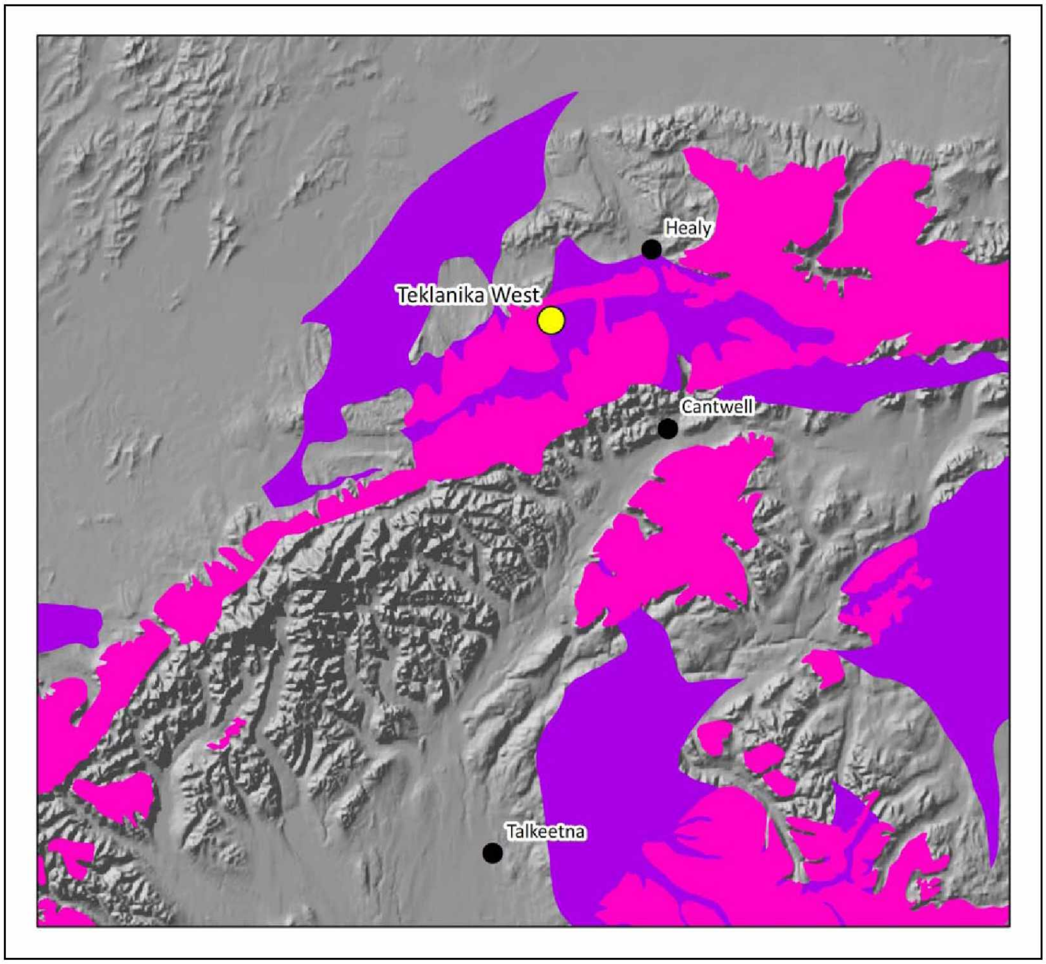

Figure 3.2. Presence/Absence of Caribou (purple) and Dall Sheep (pink) in the vicinity of Teklanika West. (GIS data Alaska Department of Fish and Game).

Murie's oppservations indicated that the Denali herds can begin to migrate in August and last until October (1944:146).

Prior to the introduction of firearms, migration hunts usually required a communal effort and the use of corrals or fences (Hosley 1966:104). McKennan believed that nearly all Athabascans used some form of a hunting fence

(McKennan 1965:47). Some fences extended for miles, with corrals being as large as a mile in diameter (Hosley 1966:98; McKennan 1965:31). It is assumed that the Minchumina-Birch Creek-Bearpaw group and others hunted communally around the central Alaska Range; however there is no evidence archaeologically or ever mentioned in ethnographies (Gudgel-Holmes 1989:18).

Sheep hunting occurred in the summer along with other large game. The Kolchan also hunted caribou and sheep during the summer in the hills (Hosley 1966:99), yet (McKennan (1965:32) notes that the Kutchin hunted sheep during the winter too, but only when other game was scarce and in need of. The Upper Tanana primarily hunted sheep during the summer and fall after moose season, "to secure sheepskins for winter" (Gudgel-Holmes 1989:19), however, interestingly, McKennan thinks this did not contribute much to their diet (1965:34-46).

Salmon runs around the central Alaska Range are sparse, yet there are a few spring-fed streams which flow northward from the Denali that contain late fall runs of salmon (Gudgel-Holmes 1989:19). Two sites known from ethnographic accounts are on the Toklat River at Knight's Roadhouse and up the Moose Creek/Bearpaw River. These spots were exceedingly important in earlier times, as they provided subsistence during harsh winters. Waterfowl, animals, and fish were attracted to these open water spots during the winter months, which provided resources for individuals (Gudgel-Holmes 1989:19-20).

Winter

The winter months were spent in a location that could the group at least one secure resource (Gudgel-Holmes 1989:20-21). Shelters were more permanent, semi-subterranean houses. Most winter sites were situated along lakes, tributaries, or major streams. These streams were generally not along major silty or glacial rivers (Hosley 1966:95). Fishing took a greater importance during these months. Fish were taken through the ice by the Kolchan, Upper Tanana, and the Kutchin (Gudgel-Holmes 1989:20). There was a winter village along Lake Minchumina that Herron noted in his travels in 1899. Even today, Lake Minchumina is recognized for its good population of fish.

The Denali caribou herd has wintered in several places over the year, one being on the flats neat Lake Minchumina or between the Foraker and McKinley Rivers (Singer 1987:122). Even when not wintering there, small groups of caribou could be found scattered throughout the lower foothills and lowlands, thus providing humans another resource during the winter months.

Fur bearing animals, such as beaver and muskrat, were also trapped during these months. Hosley note (1966:92) that beaver were an important resource for the Kolchan and Upper Tanana during the winter months. After the turn of the century, more attention was given to the trapping of beaver as it yielded a significant economic return (Gudgel-Holmes 1989:20).

Spring

The late winter/early spring caribou hunts were over by late May when Wickersham traveled up the Kantishna River in 1903. He wrote that woman were scraping hides and dying meat at the camps he visited. The first group he encountered was on his way back to the lower Tanana River after having completed the annual spring hunt at, or up, the Toklat River.

Many native elders living today in Nenana remember spring as a time of long, happy days spent at “spring camp”. A favorite spot was up the Muddy River at any one of the numerous lakes that abound with beaver, muskrat, and freshwater fish. The area is also a rich habitat for migration waterfowl which, although not mentioned, must have been capitalized on. Some families went directly from winter camps to spring camps. Gudgel-Holmes notes (1989:23) that in earlier times the spring caribou hunt would not allow for such lengthy spring camps, and that perhaps the band would split into groups. One for hunting, and the other for as she describes it “springing”. Possibly beaver and muskrat hunting was conducted earlier, before the spring caribou hunt.

Based on these data, we would expect to see small ephemeral camps during the spring and fall months (the summer too, depending on proximity to salmon or fish bearing lakes and rivers). Likewise, more permanent camps would be expected in lower elevations during winter months. Given this information, specific to the Denali/Central Alaska Range region, a more informed interpretation of the Teklanika West components may be made and the relationship, if any, between the ethnology and archaeology may be made.

CHAPTER 4: SITE GEOLOGY AND STRATIGRAPHY

The Teklanika River, a long braided floodplain system, lies parallel to Teklanika West in the upper Teklanika River Valley. Moderately rugged foothills (>1000 m asl.) consisting of metasedimentary and metavolcanic rocks (Wahrhaftig 1958) lie to the south, east, and west of the site (Figure 4.1). These terrain units comprise the notable topographic features within several kilometers of the site.

The site itself occupies a bedrock bluff, which overlooks the Teklanika River (Figure 4.2). The bluff is granitic in origin, but contains several metachert inclusions, or dikes, as they are illustrated in Figure 4.1, within the bedrock (West 1965). These inclusions are accessible from the floodplain lying directly below the site.

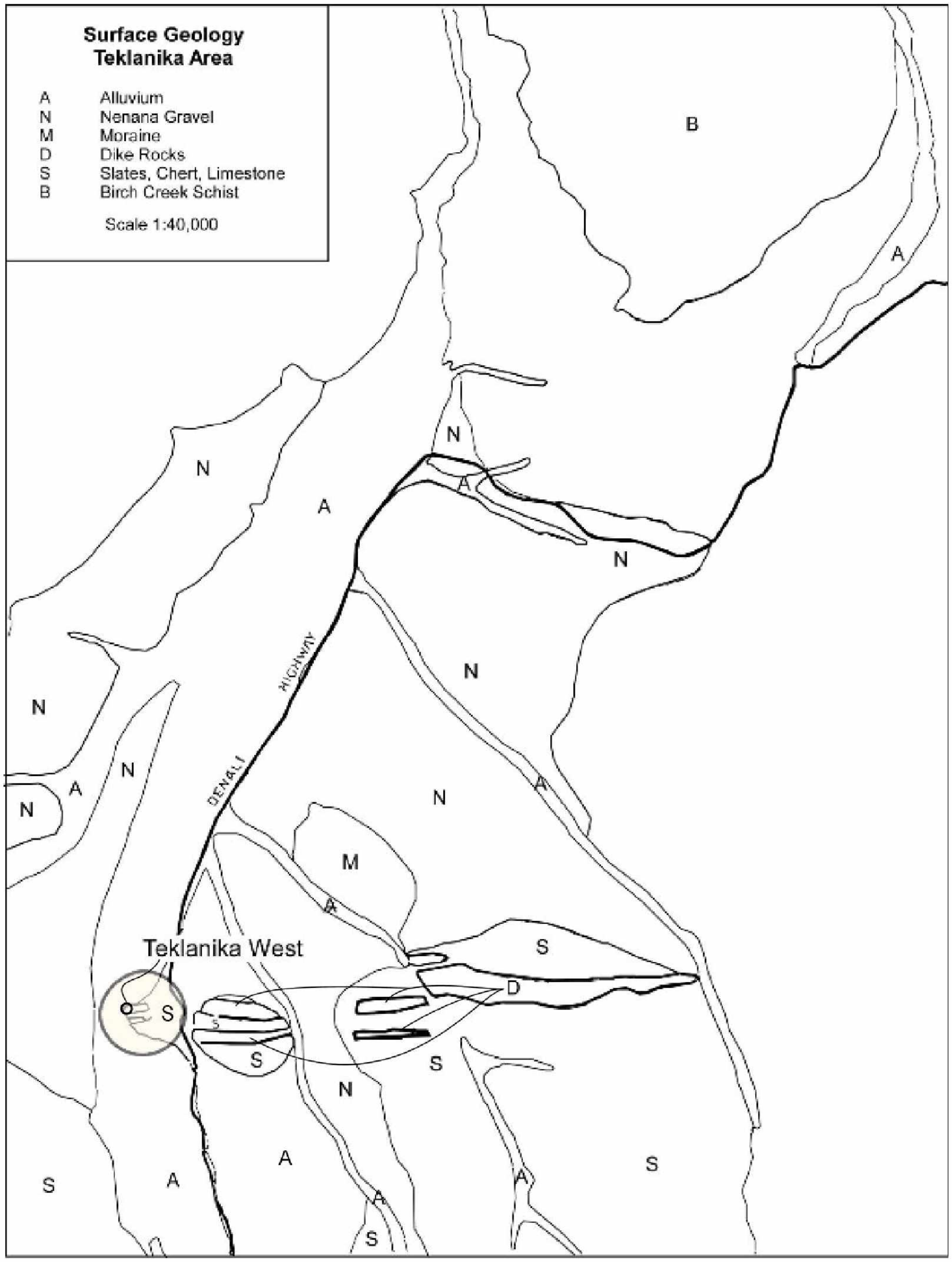

Figure 4.1. Surface Geology of the Upper Teklanika River Valley. Adapted from Treganza 1964.

Figure 4.2. Panorama view of the Teklanika Bluff overlooking the Teklanika River, view to northeast.

Site Geology

West (1965:12) described the site's stratigraphy as presumably being aeolian in origin and having discernable color differences as well as texture differences. However, West (1965:9) states these are not depositional units and they do not give evidence of either age or climatic change, but rather the changes in soil color and texture are the result of natural burning.

Goebel's 1992 description of the site's stratigraphy is that sediments appear to be aeolian in origin. Only near the bluff edge does there appear to be a periodic change in grain size (e.g. from loam to loam-sandy loam). Furthermore, from the bluff edge the loess mantle consist only of homogenous loams (Goebel 1992:4). My data supports Goebel's rather than West's interpretations of the site's stratigraphy. However, in fairness, methods and interpretations of geoarchaeology in the 1960s were in their infancy.

Objectives of the geologic study were as follows: (1) incorporate datable materials; to accurately date the archaeological and geological processes occurring at the site. (2) Assess the degree of post-depositional disturbance occurring at the site itself as well as on the cultural components of the site. (3) Document the site's stratigraphy and identify variations within the stratigraphy itself. (4) Identify disturbances that may affect component delineation and interpretation. Controlled excavations at the site allowed for a better understanding of the contextual relationships between the cultural materials and geological processes. This was a critical measure as West (1965:8) noted that three pieces of a single end scraper were recovered at three different stratigraphic levels, but all refit together. Clearly, post-depositional disturbances have affected the site. Additionally, the understanding of the post-depositional processes on artifact position and association was a key component of the research.

To assist in understanding these basic geoarchaeological questions, the following procedures were employed during the time of fieldwork. The placement of the excavation grid was oriented perpendicular to the bluff face. Units were positioned to sample across the landform in order to characterize landform stratigraphy. Each unit was arbitrarily excavated in 5 cm levels by trowel to achieve a high resolution of provenience control. Sediment samples were taken from all stratigraphic units for analyses with some being retained for future research. Sediment grain size analysis was performed to understand particle size and possibly understand sediment origins. Additionally, stratigraphic profiles drawn during fieldwork were digitized and compared with artifact 3-point backplots to understand site formation and disturbance. Subsequently, these basic geoarchaeological analyses in combination with the lithic and faunal analyses were all used to understand the site formation and site disturbance processes. Table 4.1 is a descriptive summary of the sedimentary units at the Teklanika West site.

Table 4.1. Description of sedimentary units at Teklanika West. These units vary throughout the site, minimum and maximum thicknesses are given.

Unit	Stratigraphic Unit	Thickness	Description
1	O	3-10 cm	Dark brown surface organic root mat with charred wood in lower portion. Silt to coarse silt and sand.
2	A1	30 cm	Very grayish brown, 10YR 3/2. Silt intermixed to sand.
3	Upper Tephra	1-1.5 cm	White to tan in color.
4	A2	8 cm	Dark grayish brown, 10YR 4/2. Silt intermixed with sand.
4	B/Bw	2-5 cm	Very dark brown, 10YR 2/2. Coarse silt-sand.
5	Lower Tephra	0.5-1 cm	Whitish in color.
6	C	5-20 cm	Brown, 10YR 4/3. Silt loam.
7	C Horizon Gley	2-3 cm	Dark grayish brown, 10YR 4/2. Loam.

The general stratigraphy of the site is composed of four master soil horizons; O, A, B, and C all overlying bedrock (Figure 4.3). The C horizon rests atop bedrock. Weathered regolith is present within this horizon, typically less than 50%. A well-defined paleosol is present in the C horizon. There was very little evidence of cryogenic movement of artifacts occurring within the C horizon. This interpretation was based on artifact positions. Artifacts tended to be laying horizontal as opposed to vertical in nature, which would have indicated cryogenic processes. Both well preserved and fragmented faunal remains were recovered from this horizon. Those remains, which can be identified, are consistent with bison (*Bison* sp.). Spruce (*Picea* sp.) fragments were identified from the paleosol (Wigend 2010 personal communication), with these fragments being dated to 6770 ±50 B.P. (Beta-276455) and 7030±40 (Beta-292107. Both of these dates are consistent with Goebel's (1996) date of 7130±98 (GX-18518), firmly dating the palesol complex.

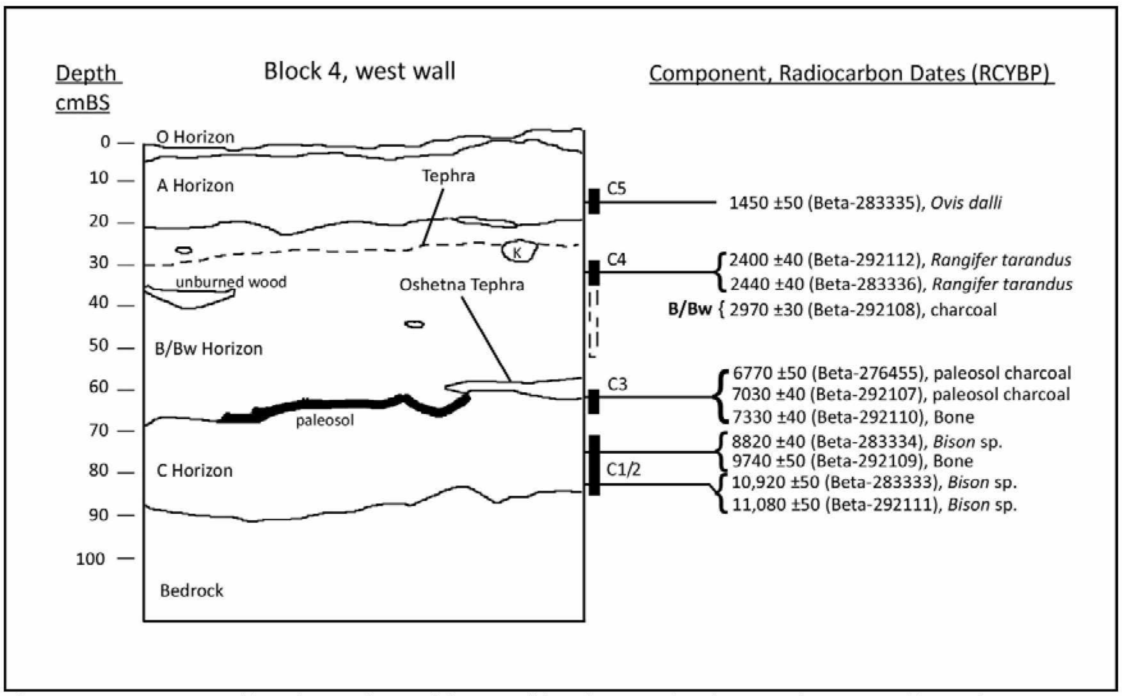

Figure 4.3. Generalized stratigraphic profile, from Block 4 and new radiocarbon dates.

The upper B/Bw horizon is composed of roughly 45cm of deposition. A lower tephra at the base of the Bw, top of the C horizon is present. This lower tephra is discontinuous throughout the site and only appeared in block 1. Microprobe analysis of tephra samples from block 1, occurring at about 60-70cm below the surface, identified the sample as being the regional known Oshetna Tephra (cf Dilley 1988; Dixon 1985 for more information) (Addison and Beget 2010). This tephra lies at the contact of the Bw and C horizons and seems, at least at block 1, where the samples were collected, to cap the late Pleistocene and early Holocene components of the site. Despite the fact the samples came from a single location, it is worth noting that analysis of sediments from block 3 indicated that the sediment matrix contained high frequencies of glass shards consistent with those of volcanic ashes (Wigend 2010 personal communication). As there was not enough of a sample to run via microprobe analysis, it remains uncertain if this is the Oshetna tephra or not, but depth and stratigraphic position and location to that of Block 1 is similar.

The B/Bw horizon is associated with component 4 of the site. Evidence for cryoturbation on artifacts was observed. Many artifacts recovered at this level were vertical in position, with very few lying horizontal. Faunal remains were recovered from this level, these were largely fragmented and unidentifiable. Those able to be identified are consistent with caribou (*Rangifer tarandus*), and dates to ~2400 B.P., see Chapter 5.

The uppermost component, Component 5, is associated with the A horizon and root mat of the site. The A horizon is about 10-25 cm thick gleyed, and occurs about 5-7cm below the surface. Artifacts recovered from this level showed that cryoturbation has affected the position of artifacts. A small amount of faunal remains were recovered from this level. Identifiable remains came from Dall sheep and have been dated to 1450±40 B.P. (Beta-283338). Despite this, the majority of these remains are fragmentary and remain unidentifiable.

Geochronology

Dating of strata is crucial for understanding site formation and disturbance. As noted above, there is considerable debate as the age of the occupations. West (1965, 1967, 1975, 1996) was unable to date one of two (in his opinion) cultural occupations at the site (the occupation under the O-horizon). The other occupation occurring approximately 50 cm below the surface was dated to around 3638±128 (West 1996). This date was not from cultural features, making it difficult to evaluate the relationship of this date to the cultural materials. This may have been due to the fact that West's excavations at the site were limited in space constrained to only a small part of the bluff. Goebel's reinvestigation of the site (1992) identified three cultural occupation(s); the first, undated, occurring directly under the root-mat (O-horizon), another occurring at around 5340±90 B.P. and the last at around 7130±98 B.P. Both dates were obtained from the stratigraphic horizons with limited association with cultural materials. These data suggested that the site was multi-component (Goebel 1996), yet one problem is the charcoal that produced these dates was collected from a single unit profile (Goebel 1996), and the relationship between these samples and cultural materials was limited. Variability across the site was not accounted for. Areas closer to the bluff face may have substantially less sediment deposition as opposed to those areas situated further away from the bluff edge. Moreover, rates of sediment deposition and vegetation growth may be different on the north face of the bluff versus the south face.

With these different factors in consideration, my research put an emphasis on dating faunal materials rather than charcoal from the site, as charcoal can easily be redistributed through post-disturbance processes. Despite the fact that bone collagen is more susceptible to contamination (Nelson and Møhl 2003), this method of dating offers a better way to directly date the cultural components. This method also provides additional indicators into paleodiet (Van Klinken 1999) and determination of either marine and/or terrestrial animals (Schoeninger and DeNiro 1984). The dating of faunal materials in direct association with cultural materials acts as a "target" event for people as opposed to dating dispersed charcoal.

Both fragmentary and identifiable faunal remains were recovered at the site from all stratigraphic levels and all were in clear association with cultural artifacts. Special treatment was given to those remains, which could be identified and did not show signs of contamination. Faunal remains needed to weigh at minimum 2 g (Beta 2010), in good condition with minimum exposure of collagen, in clear association with cultural material, be in good context, showing no signs of post depositional movement or disturbance, and if at all possible, able to be identified. With these criteria set, eight bone samples were submitted for collagen extraction and AMS dating at Beta Analytic. Supplementing these collagen dates were three AMS dates on charcoal that were stratigraphically associated with the faunal materials and artifacts. Dating the two material types acted as a check on each other while further contributing to the research objectives of dating the cultural components and geological processes at the site. Figures 4.4 and 4.5 show the location of the selected faunal materials for the new dates as well as the location of Goebel's (1996) dates. Table 4.2 and 4.3 shows the context of each sample and the results.

Table 4.2. New radiocarbon dates for Teklanika West.

Coordinates	Block	Strat.	Material	13C/12C Ratio	14C Age	Calibrated Age	Lab #
N202.12/E213.11	1	O/A	Bone collagen	-17.7‰	1450±50	1295-1403	Beta-283335
N204.49/E195.99	4	B	Bone collagen	-17.2‰	2440±40	2355-2547	Beta-283336
N205.05/E204.26	3	C	Paleosol, charcoal	-24.7‰	6770±50	7565-7689	Beta-276455
N203.25/E213.18	1	C	Bone collagen	-17.6‰	8820±40	9697-9957	Beta-283334
N202.55/E194.77	4	C	Bone collagen	-19.8‰	10920±50	12,828-12,941	Beta-283333
N205.20E204.15	3	C	Paleosol, charcoal	-23.5‰	7030±40	7786-7953	Beta-292107
N202.52E194.74	4	B/C	Charcoal	-23.3‰	2970±30	3060-3259	Beta-292108
N204.08E194.72	4	C	Bone collagen	-20.6‰	9740±50	11,083-11,247	Beta-292109
N202.48E213.25	1	C	Bone collagen	-21.1‰	7330±40	8020-8204	Beta-292110
N204.94E194.30	4	C	Bone collagen	-20.0‰	11,080±50	12,902-13,095	Beta-292111
N204.00E195.10	4	B	Bone collagen	-18.1‰	2400±40	2342-2514	Beta-292112

Table 4.3. Previous radiocarbon dates at Teklanika West

Profile	Strat.	Approximate Depth (cm BS)	Material	14C Age	Calibrated Age	Lab #
A	A	40	Charcoal	1770±70	1537-1833	Beta-59592
A	B	60	Charcoal	3310±100	3357-3735	Beta-59591
A	B	65	Charcoal	5340±90	5933-6289	GX-18517
A	C	100	Charcoal	7130±98	7754-8170	GX-18518

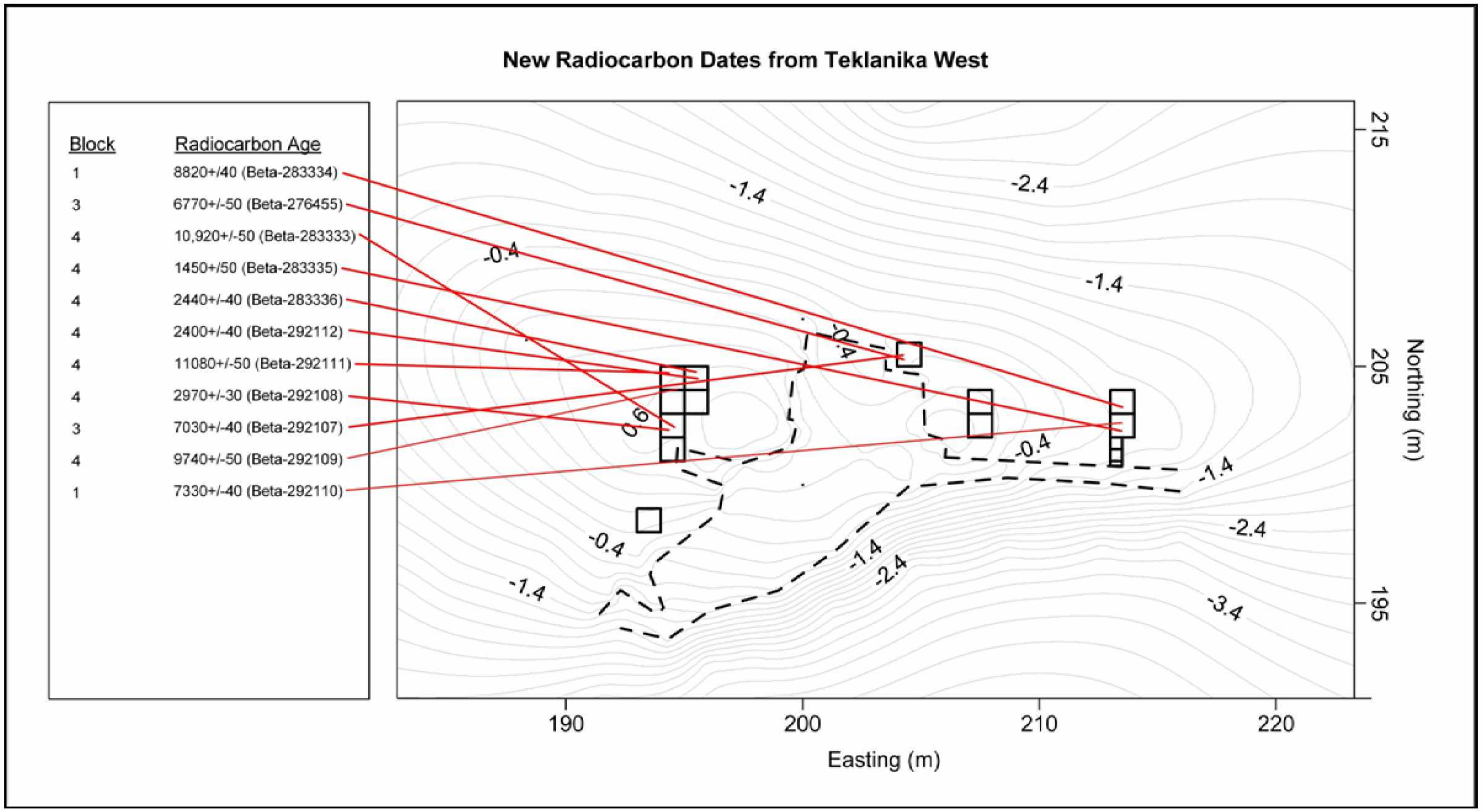

Figure 4.4. Location of radiocarbon dates from Teklanika West.

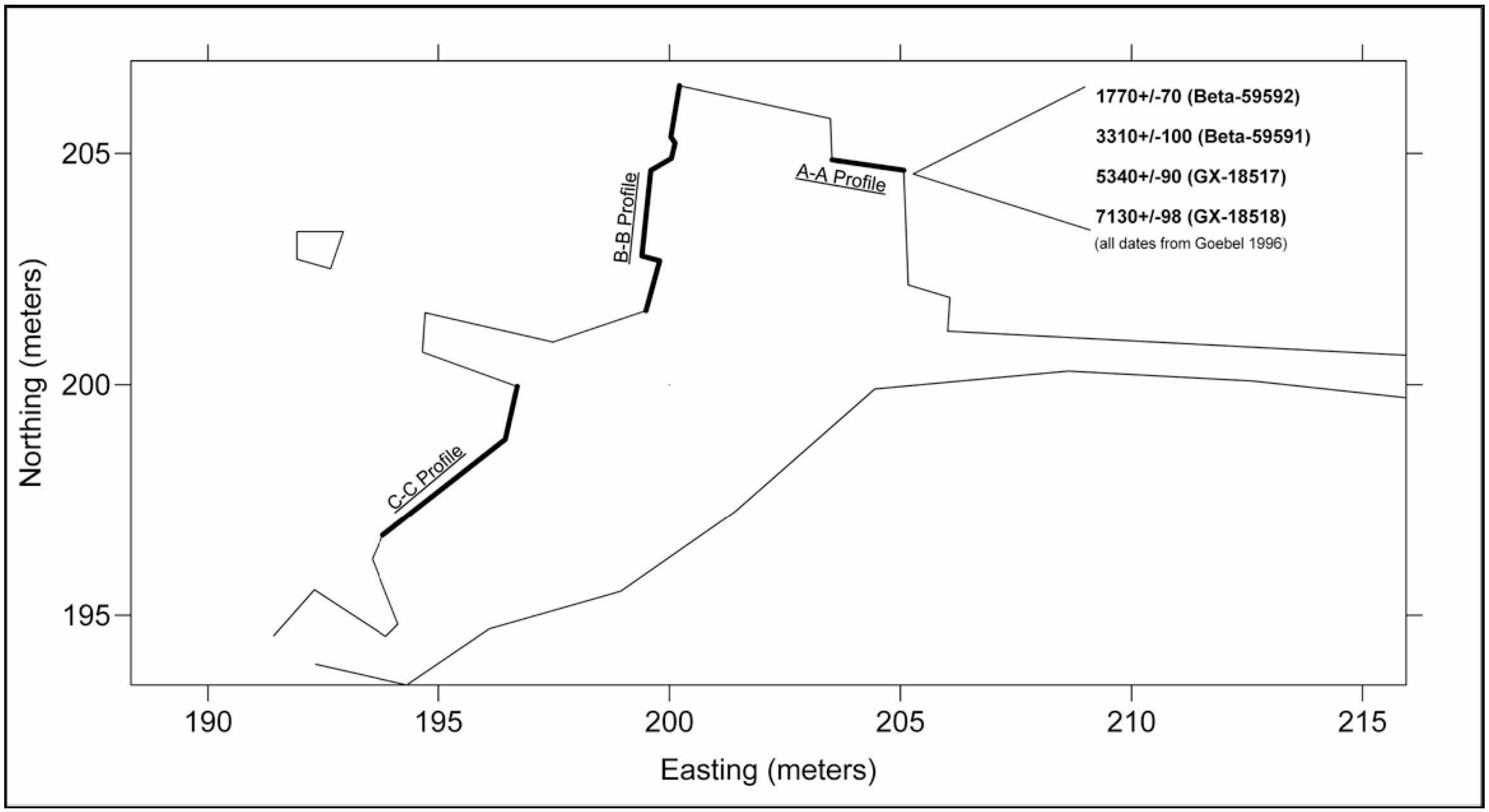

Figure 4.5. Location of previous radiocarbon dates. (Profile designations were kept to be consistent with literature (cf Goebel 1992)

Defining Components

The radiocarbon dates on collagen and charcoal provided secure delineation of components at Teklanika West. The faunal remains were in clear association with artifacts, providing reasonable estimates on site occupation ages. The radiocarbon assays were calibrated with the IntCal09 calibration curve (Stuiver and Reimer 1993). All dates were internally consistent and congruent with stratigraphy, particularly with the two key strata seen in most profiles: the paleosol and the upper tephra. The individual dates and these two stratigraphic landmarks serve as checks to allow delineation of components. The faunal materials, which were dated, were in excellent association with artifacts, as outlined above. The calibration of these dates is shown below in Figure 4.6. All of these dates split out consistently and correspond well with two key strata, which were seen almost throughout the site, these being the paleosol and the upper tephra. The dates and the "landmarks" helped serve as checks on each other while allowing me to formulate ways into breaking out the components of the site.

The dates bracket the age of the upper tephra. Those artifacts, which occurred above the upper tephra, were classified as Component 5. Component 4 consists of artifacts within the A horizon below the upper tephra and above the paleosol. Component 3 consisted of artifacts associated with the paleosol.

Component 3 was defined by dating the paleosol. Three dates all tend to cluster around 8000 cal B.P. During the excavations, artifacts were found on and in the paleosol matrix. Additionally, the paleosol served as an excellent marker throughout the site. Taking into account landform relief and variability, both horizontal vertical placement of artifacts and their relation to the paleosol were accounted for. Artifacts that were recovered from the same stratigraphic level as the paleosol were grouped into Component 3.

Components 1 and 2 were defined the same way as the previous components, by combining artifacts, which were recovered from the same levels as the radiocarbon dated materials, while again taking into account landform relief and variability across the site. Components 1 and 2 consist of artifacts associated with stratum the C horizon, below the paleosol and above bedrock. There were problems with this as Component 2 dates do not overlap at two-standard deviation, despite this I still combine the two dates together and refer to them as a generic Component 2. Figure 4.6 illustrates this, but both dates are separated by a dashed line indicating they do not overlap and rather they may represent a Component 2a and 2b instead. Again, I took into account landform variability, those artifacts that were recovered from the same levels as these two dates were combined and analyzed as a single component. Yet, it is probable that Component 2a and 2b represent palimpsests.

Component 1 was defined based on the two radiocarbon dates and those artifacts that were recovered from the same level as those faunal materials which produced those dates. Those artifacts that were recovered below the level that produced these dates, ranging in depth of 5-10cm to bedrock, were also incorporated into Component 1. These delineations of components are tentative.

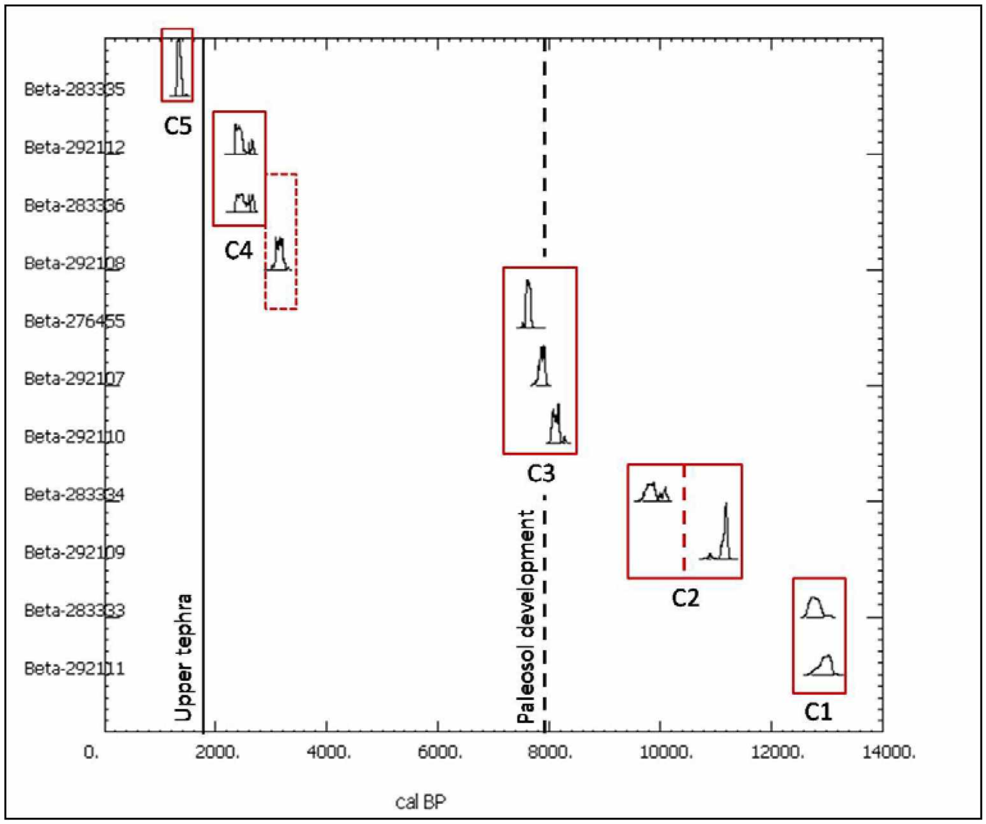

Figure 4.6. Component designation based on radiocarbon dates.

Discussion

The nature of the sediments varies in thickness and character in relation to several environmental factors acting on the site. Surface slope, drainage potential, and exposure to southerly winds, means the exposed area of the site has more sandy units than the northerly facing side. This was made clear when reexamining both the C profile and profile of Block 5 and Block 2 profiles, Figures 4.7 and 4.8.


Figure 4.7. Block 5 east profile. Bags indicate an area of disturbance.


Figure 4.8. Block 2 north profile. Cryoturbation and area of disturbances are present..

There was about 10 cm of O/A horizon followed by nearly 60 cm of sandy-loam. The A and B profiles, discussed by Goebel (1996) have more complex stratigraphy. These profiles contain more silt-loam and aeolian-deposited materials.

Figure 4.9 shows the generalized stratigraphic profile from Block 4, west wall, which was further away from the bluff's edge. Distinct soil horizons are present and soil morphology differs. The C horizon is composed nearly of a weathered, likely aeolian deposited loam. Sandy loams were virtually non-existent here and in the other blocks further from the bluff's edge. These areas further from the bluff edge also contain a higher presence of peat likely attributed to the relief of the landform. The bluff edge is well drained while areas further back are poorly drained allowing for the formation of the peat.

Evidence of post depositional disturbance both by bioturbation or cryturbation processes were evident in all of the blocks. Bioturbation, in the form of krotovenias, were present within all of the blocks except for Block 3. However, evidence of cryoturbation was seen in all of the blocks. Figures 4.10-14 show vertical backplots for all artifacts from their respective block. Artifacts were recovered in both vertical and horizontal positions in all of the blocks at the site. This indicated that some post depositional disturbance had occurred. There was little to no separation of artifacts within blocks.

Based on all the radiocarbon results, it is apparent that the upper Teklanika

River Valley was ice-free by ~13,000 cal B.P. years ago. Loess deposition, presumably from the headwaters and gravel bars of the Teklanika River, began shortly thereafter with humans arriving at the site by around ~12-13,000 B.P. years ago. The landscape at this time would have been able to support bison (*Bison* sp.) based on the identification and presence of these remains at the site. Loess deposition continued over the next thousand years. Bison (*Bison* sp.) were still present in the area during the late Pleistocene/Holocene transition at about ~9900-11,000 cal B.P. years ago. Component 2 at the site supports this. Shapiro et al. (2004) have shown there is a decrease in genetic diversity in bison populations >25,000 B.P., and their aDNA studies show that modern bison were descended from populations that were south of the ice before the last glacial maximum and that diversity had been restricted to at least ~14,000 cal B.P.. years ago.

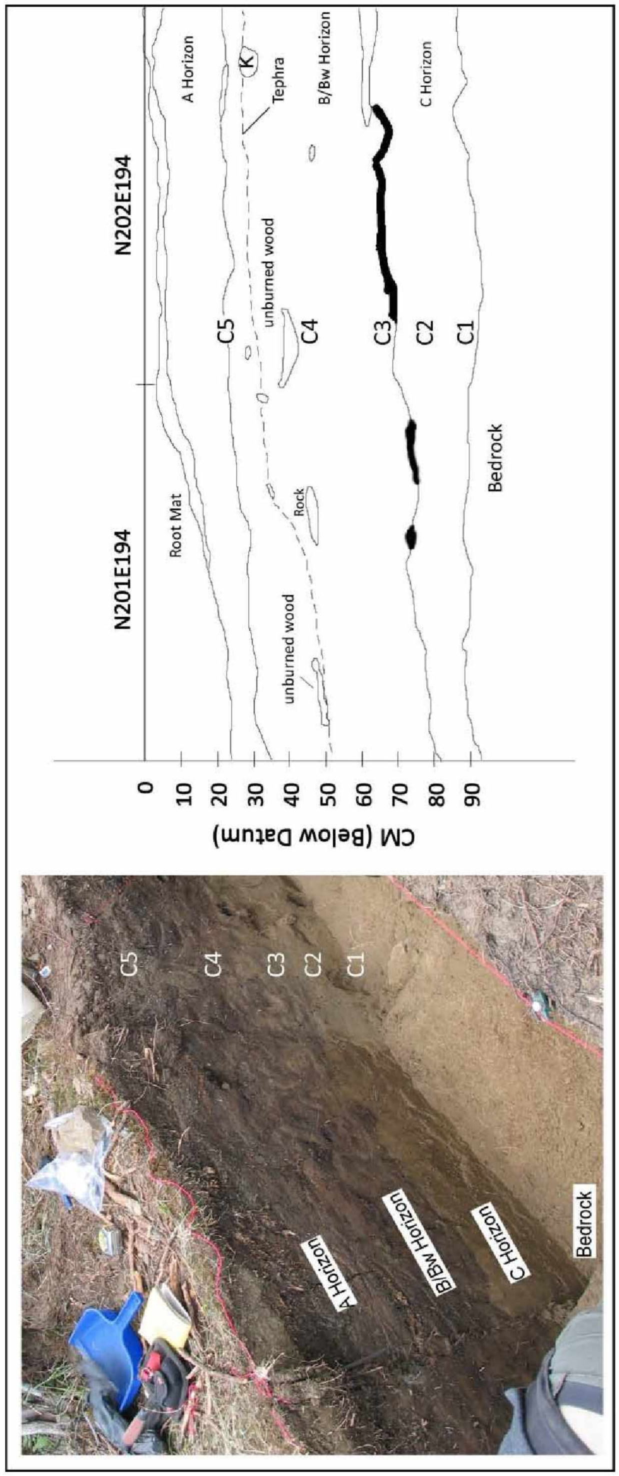

Figure 4.9. Generalized stratigraphic profile showing components and their relation to the stratigraphy.

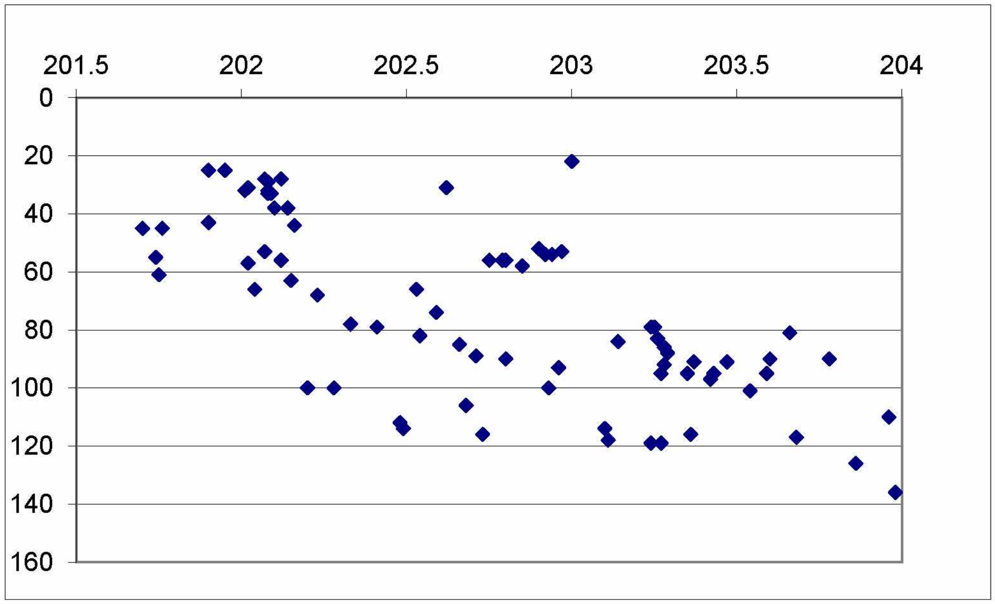

Figure 4.10. Block 1 vertical backplot of the west wall. Showing all lithic artifacts from wall.

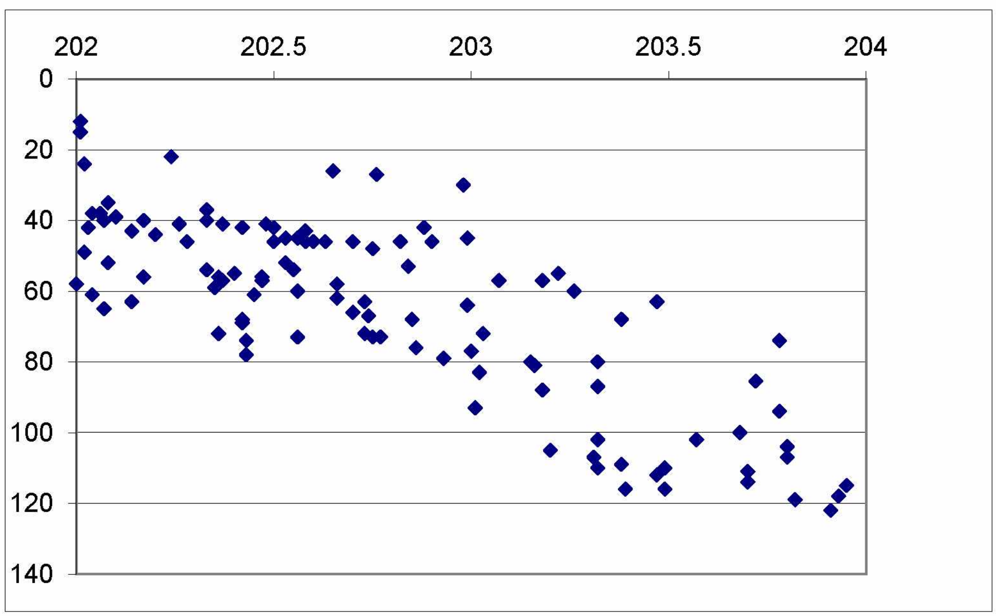

Figure 4.11. Block 2 vertical backplot of the west wall. Showing all lithic artifacts from wall.

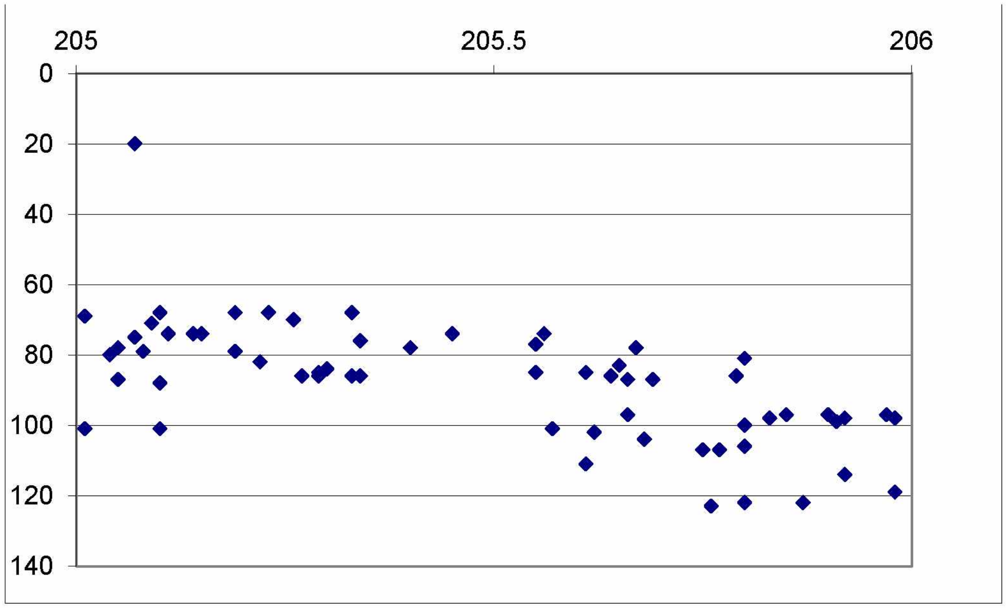

Figure 4.12. Block 3 vertical backplot of the west wall. Showing all lithic artifacts from wall.

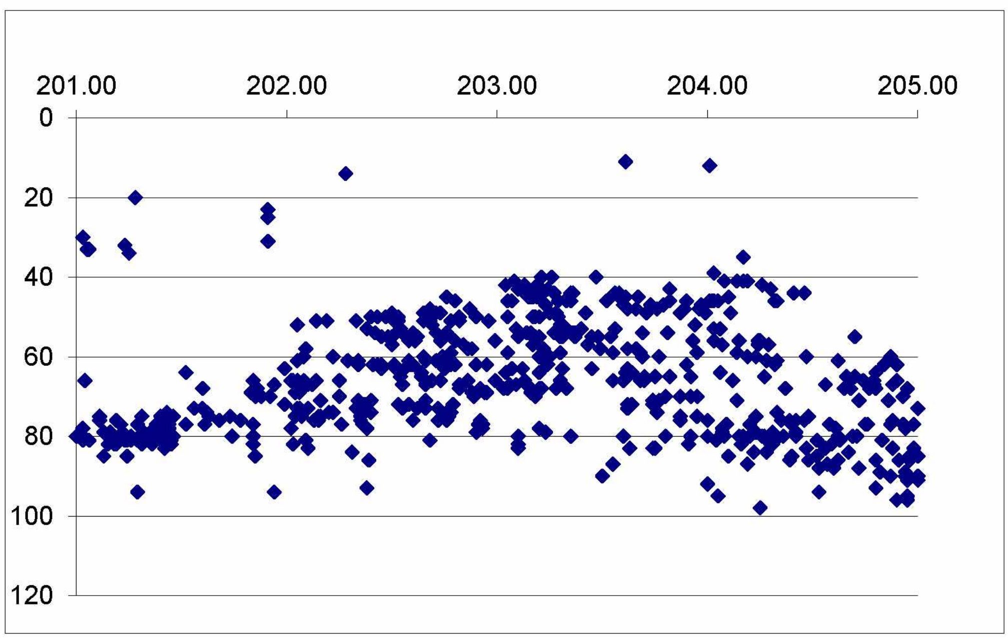

Figure 4.13. Block 4 vertical backplot of the west wall. Showing all lithic artifacts from wall.

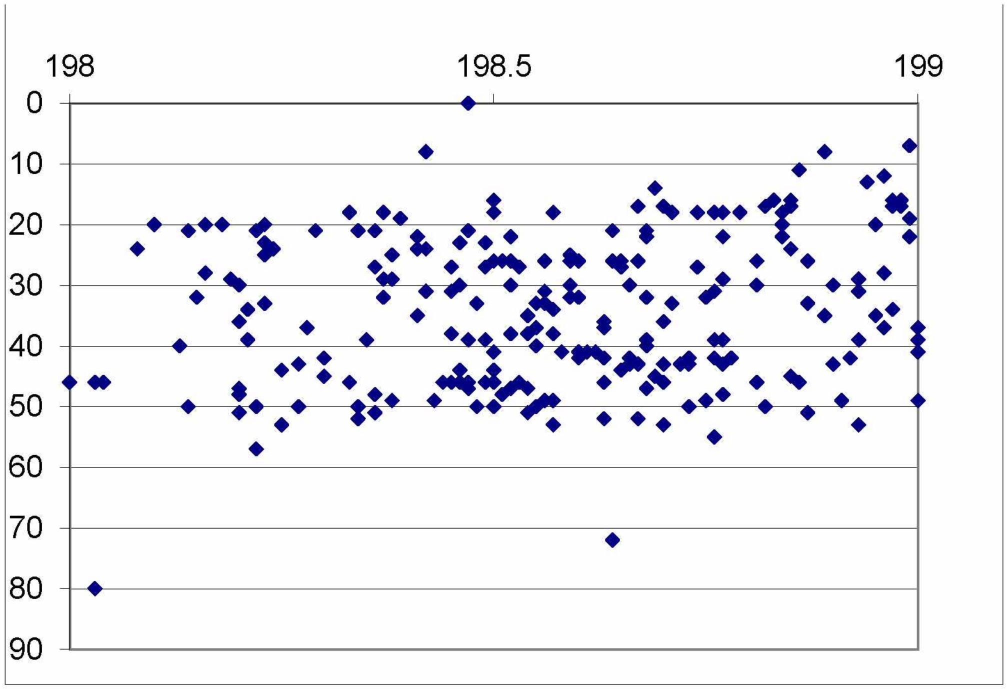

Figure 4.14. Block 5 vertical backplot of the west wall. Showing all lithic artifacts from wall.

Paleosol formation began at the site and is implied to have begun in the area around 8,000 cal B.P. years ago. A single date on charcoal of about 7100 B.P. was obtained by Goebel in 1992. Though this material was limited in space across the site and came from a single unit profile it may indicate that an initial paleosol was beginning to form at this time. This interpretation of an early paleosol formation corresponds well with two dates of about 7500-8000 cal B.P. that were obtained from the paleosol. Paleosols generally imply a time of climatic stability. Additionally, this formation corresponds well with the spread of the Boreal forest in and around the area (Bigelow 1991; Bigelow and Powers 2001). The regionally-known Oshetna tephra overlays this paleosol and might be interpreted as a time of slight catastrophe, as there is a faint trace of loess which begins to be deposited at the site. Modern B/Bw horizon overlays the faint trace of loess and tephra.

Goebel (1996) dated charcoal located within the B/Bw horizons. These dates were about 3300 and 5300 B.P. years old. By this time the Boreal forest was established in the region, however these dates continue to date possible human occupations at the site, but more importantly indicate that silt was still be deposited at the site during the mid-late Holocene. Moreover, it is during this time period that there were quick episodes of loess deposition occurring at the site, based on large concentrations of unburned wood (*Picea* sp.) within the stratigraphic profiles. An upper, unidentified tephra, was deposited shortly after 1770 B.P., and before 1500 B.P.. Goebel (1996) hypothesized this may be either the Devil or Watana tephra independently dated elsewhere in south-central Alaska to ~1400-1600 B.P. and 1900-2700 B.P. respectively [Dixon and Smith 1990-394] (Goebel 1996). Modern O and A horizons are present after this.

These data show have shown the complexity in both site formation and disturbance that occur at Teklanika West. Many of these analyses were limited, a more in depth analyses should be carried out to address and understand the micromorphology and pedogenesis which are taking place at the site.

CHAPTER 5: FAUNAL ANALYSIS

The rarity of identifiable faunal remains in upland areas in the Alaskan subarctic has been noted above. Teklanika West fauna are important in their potential to illuminate subsistence economy and hunting practices in these upland ecosystems and potential changes through time. This something that has was not well addressed with previous research at the site as well as in the interior of Alaska. Similar to Dry Creek, which contained identifiable faunal remains dated to the late Pleistocene in age and associated with human manufactured artifacts. Teklanika West contains faunal remains dated to the late Pleistocene and are associated with stone tools makes the site significant, because it can offer valuable information into upland subsistence and due to the continued occupation of the site through the Holocene, the site's faunal assemblage shows change through time as well.

Faunal remains were recovered during the 1960s excavations at the site by Treganza (1964) and West (1965), which were associated with the A horizon of the modern soil (West 1996). However, these were not linked with any component. West stated that some of the fauna from the site might be moose (*Alces alces*) (1967). These identifications were later expanded by Spiess (1982) (see West 1996) who reported to West that the bones recovered from the site were of modern mammals – mountain sheep, caribou, and several small mammals. West interpreted these to be non-cultural in origin and were deposited at the site naturally. Therefore, reinvestigating and/or possibly linking these remains with cultural occupations was important, as it would provide considerable information about large and small animal use, as was the case at Carlo Creek (Bowers 1980) and for understanding and elaborating on the seasonal round practiced by prehistoric hunter-gatherers in the Holocene. These data can also aid in evaluating limitations of using ethnographic analogies to understand earlier prehistoric behaviors.

Beyond association, there are a number of site structural, organizational, and activity problems that can be addressed through faunal analyses (Lyman 1979; Reitz and Wing 2002). Based on the previous research, my project sought to address the following objectives for faunal analyses: (1) how was faunal being utilized among the components of the site; (2) assess the degree of spatial patterning of fauna among components and contrarily throughout the site; (3) butchering and processing decisions; (4) trying to understand human behavioral decisions; and (5) taphonomy to what extent of the fauna at the site was human modified, versus naturally accumulated. Methods to address these questions have included spatial patterning, fauna refitting, economic-utility indices, breakage patterns, and mortality profiles.

Faunal analyses have been conducted to address the different research objectives. My analysis has been able to identify the element and different animal taxa. In addition, I have been able to determine other key features (when present) (e.g. tooth size, epiphyseal fusion) all of which have been useful in understanding the species and age of the animal. Analyses have been based on standard faunal analyses (Klein and Cruz-Uribe 1984; Reitz and Wing 2002) yet, it is unlikely that specific quantifications (i.e. MNI, MAU, %MAU) would be useful, however, there was not enough individuals represented in the sample size. An important aspect of the analysis will be trying to determine the seasonality of the remains. This is important, because these data can be used to delineate seasonal occupation of the site by humans. As per modern day observations, different animal resources are present in the upper Teklanika River valley area at different times of the year. The availability of these resources could considerably effect human decision making as to when they should utilize these resources. Understanding this relationship between human decision making and availability of resources will likely contribute to the possible benefits or limits, of the ethnographic record, by understanding whether or not these findings would be congruent with what would be expected to be seen in the ethnographic record or not. Is there an emphasis on caribou and Dall sheep use as there is in the ethnographic record or are other species present within the archaeological record. Additionally, based on the ethnographic record, how these faunal remains might be used to address seasonality and hunter-gatherer seasonal rounds.

Further, spatial analysis using *Surfer 8* to assist in identifying concentrations and activity areas of faunal materials within the site. Refitting of faunal materials did not help with identifying butchery activity areas and their relationship to other artifacts. These data should help with assigning faunal remains to specific components and be an additional aid to delineate possible seasonality among the different components represented at the site.

Faunal Analysis

Faunal analysis as defined here is minimally the identification, analysis, and interpretation of bone remains from an archaeological site. Faunal analyses can provide a considerable amount of information to the researcher provided they have a large dataset. This however, was not the case. There were 139 faunal remains recovered from the site, of which 17 could be identified to element and 8 were identified to taxon. During the excavations, faunal remains representing four different taxa were recovered; each of these remains was stratigraphically associated with cultural materials at the site. The way in which I approached identifying these elements was largely attributed to using comparative specimens of caribou, Dall sheep, and bison. These comparative collections came from the zooarchaeology lab at the University of Alaska Fairbanks as well as the Museum of the North. When identifying these elements, I matched key landmarks on the remains recovered to landmarks on the comparative sample. Most of these basic landmarks were derived from Reitz and Wing (2002).

Component 1 Faunal Remains

Those faunal remains associated with Component 1 (n=13; 12%), of which two elements could be identified and are consistent with bison (*Bison* sp.) (Figures 5.1 and 5.2). These remains are composed of a proximal tibia fragment

(Figure 5.3) (weighing 65.17 g, with a length of 93.3 cm, width of 61.0 cm and thickness of 1.3 cm) and proximal femur fragment (weighing 134.1 g, the length was 120.08 cm, width 80.4 cm, and a thickness of 6.07 cm). Both of these were found at a depth of 70-75 cm below the surface within the loam horizon lying above bedrock (Figure 5.4). None of these remains showed evidence of being burnt or have signs of cut marks. However, cultural artifacts were in clear association with these faunal remains. Bone collagen dating of the bison femur yielded a radiocarbon date of 10,920 ±50 B.P. (Beta-283333), with the tibia yielding a bone collage date of 11,080±50 B.P. (Beta-292111).

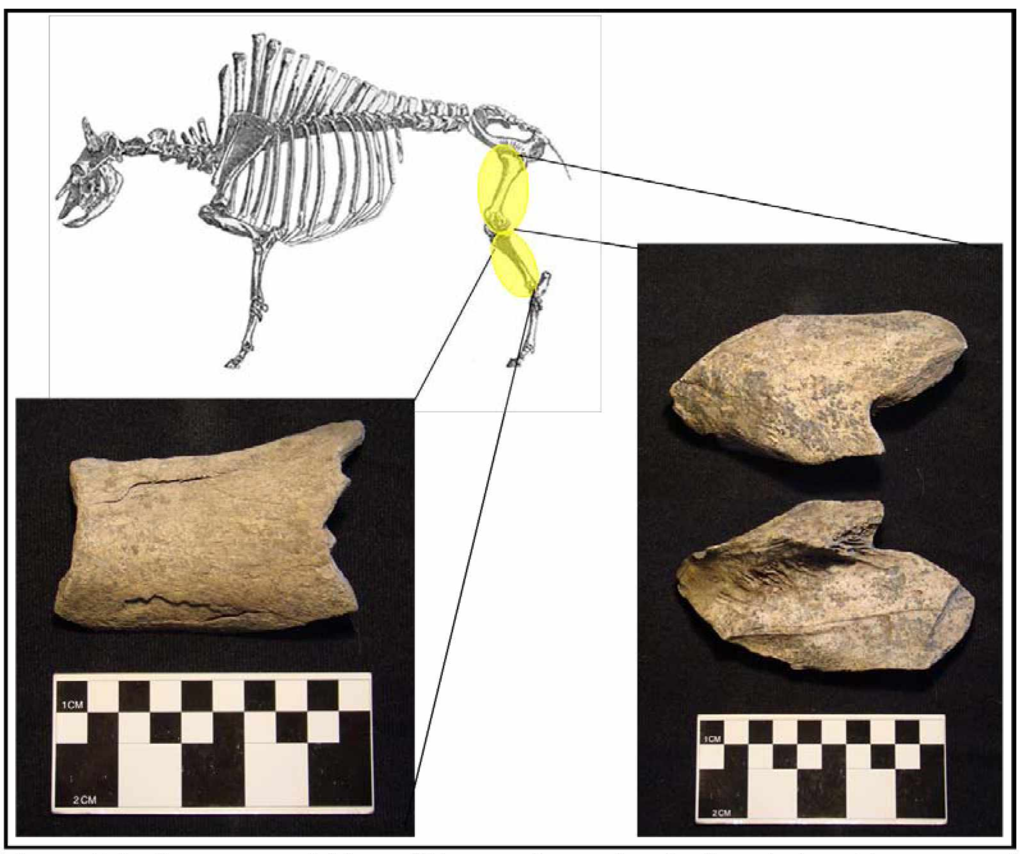

Figure 5.1. Component 1 bison (*Bison* sp.) remains, before dating. Femur remains are shown *in situ* in Figure 5.2 and tibia fragment is shown *in situ* in Figure 5.3.

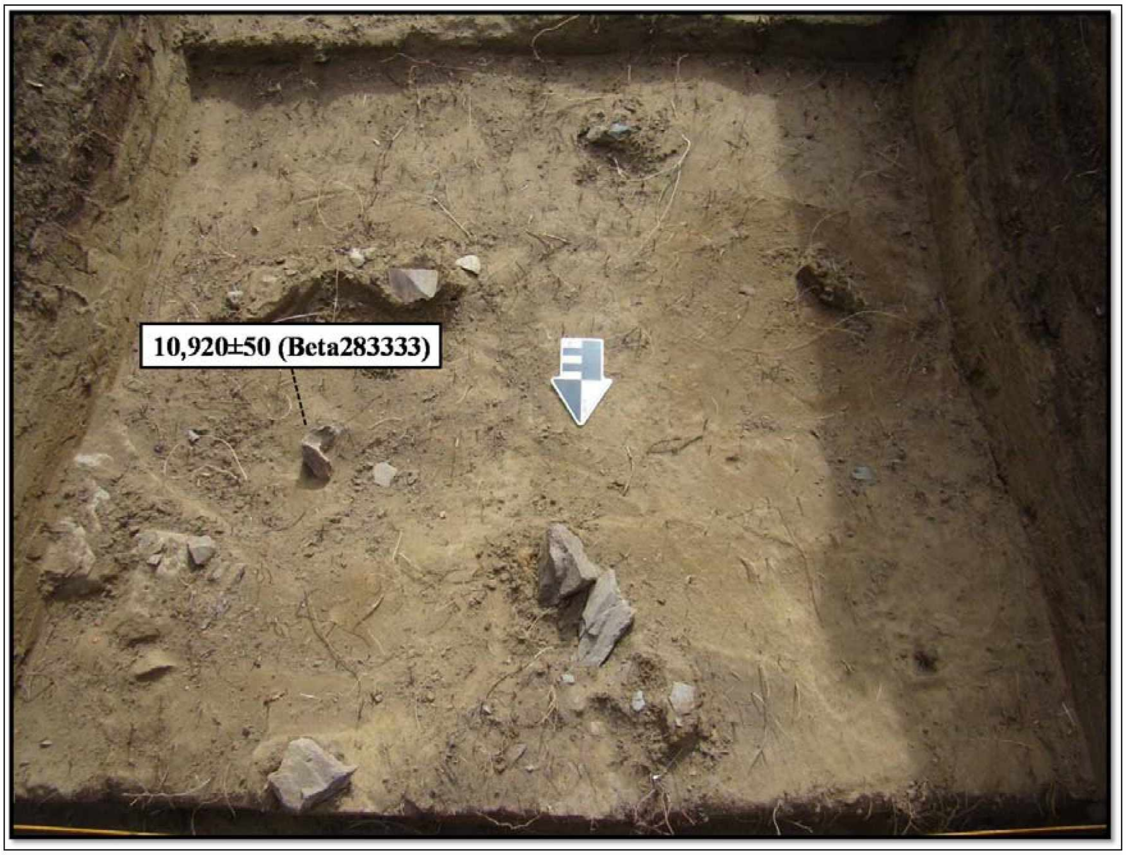

Figure 5.2. Bison remain *in situ*, with associated cultural materials.

Figure 5.3. Bison remain *in situ*.

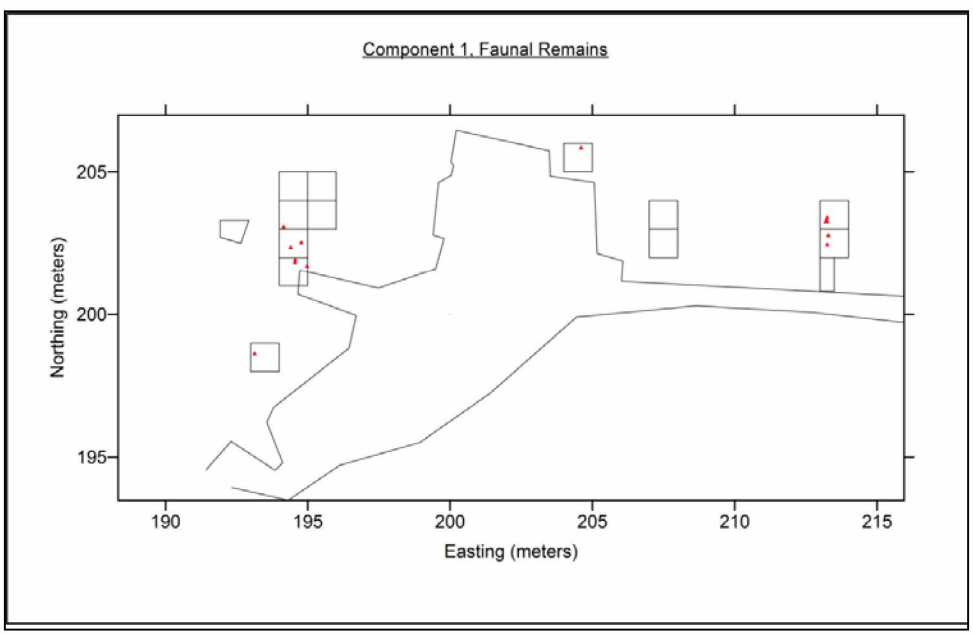

Figure 5.4. Spatial distribution of Component 1 faunal remains.

Component 2 Faunal Remains

Faunal remains from Component 2 consist largely of unidentifiable fragmented materials (n= 11; 6%). However, Block 1 contained a single identifiable element. This element was a distal fragment of the pelvis (weight of 27.57 g, and a length of 6.2 cm, width 5.62 cm, and a thickness 2.2 cm) of a bison (*Bison* sp.) (Figure 5.5). A single bone collagen date of this specimen yielded a date of 8820 ±40 B.P. (Beta-283334). A second date was obtained from bone fragments (weighing 6.19 g) associated with lithic materials from Block 4. These remains were recovered at the same stratigraphic level. The date on these remains was 9740±50 B.P. (Beta-292109). These two dates do not overlap at two sigma and are significantly different at the 95% confidence level ($t=206.439$; $\chi^2=3.84$; $df=1$). Based on these results, I still recognize these two dates as being associated with Component 2, but assign the two occupations, which cannot be disentangled by stratigraphy. As stated before these two dates for Component 2 likely, represent a palimpsest. Figure 5.6 shows the location for all of Component 2 faunal materials.

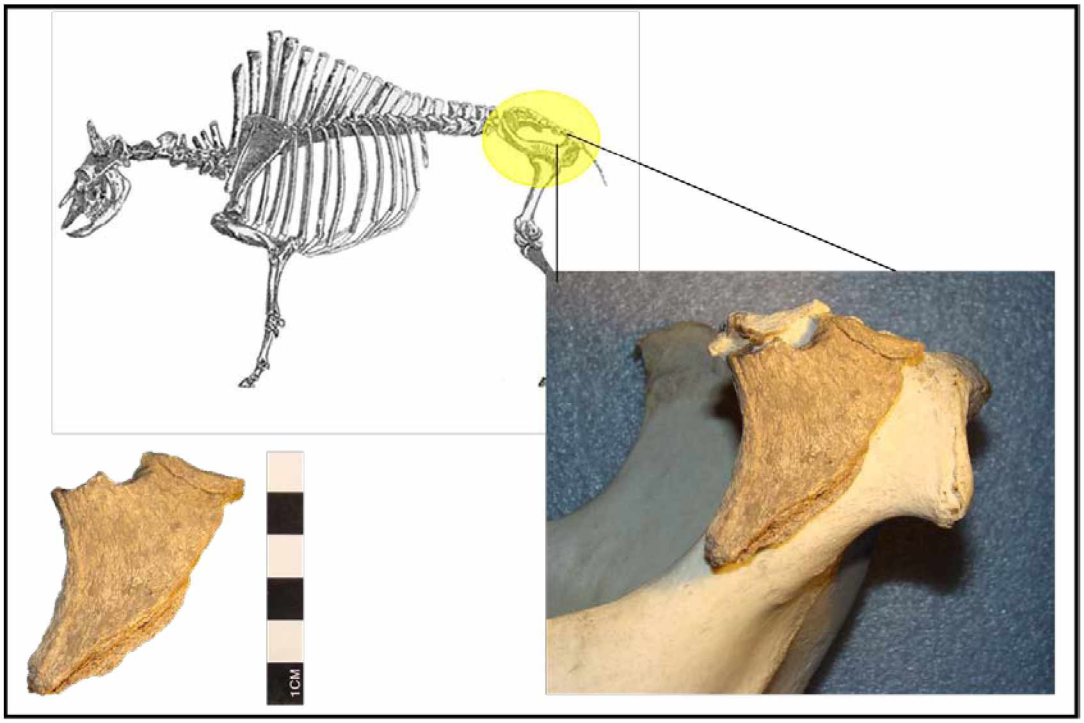

Figure 5.5. Component 2 bison (*Bison* sp.) remains, before dating.

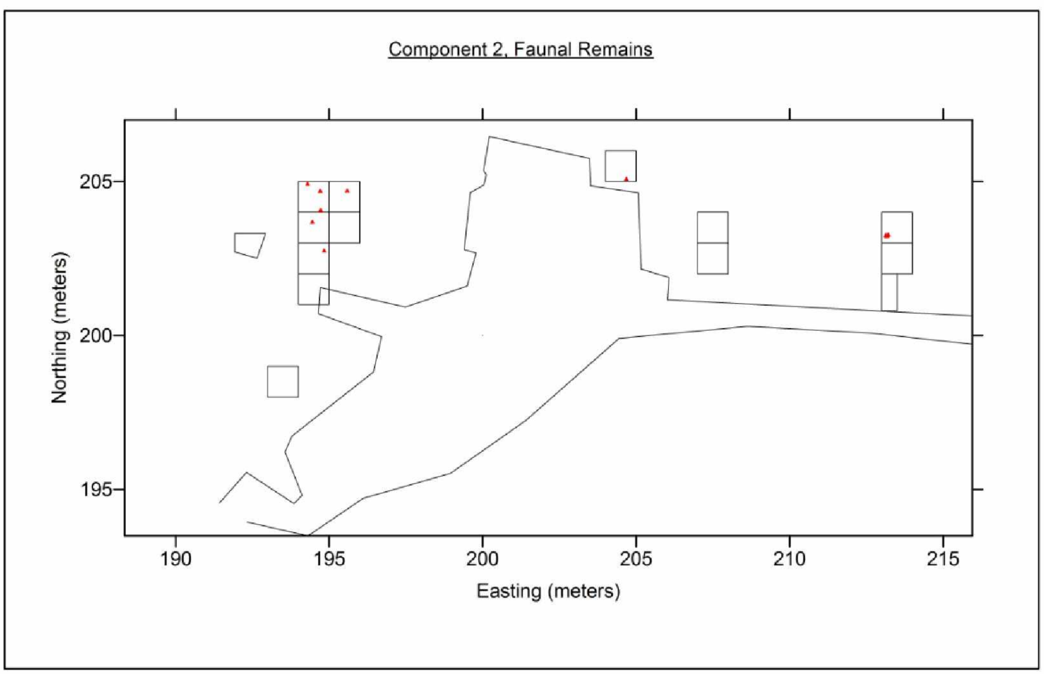

Figure 5.6. Spatial distribution of Component 2 faunal remains.

Component 3 Faunal Remains

Component 3 is associated with the paleosol of the site. No identifiable faunal remains were recovered from this component. Fragmentary faunal remains (n=19; 7%) comprise the majority of faunal remains from this component. However, a date of 7330±40 B.P. (Beta-292107) was obtained from a long bone fragment from Block 1 (weighing 13.23 g., with a length of 6.21 cm, width of 4.31 cm, and a thickness of 1.78 cm). This fragment was recovered at a depth of 100-105 cm below the surface, well below the paleosol of the site. This may indicate post depositional disturbance and/or reposition of this bone fragment, as it was below the paleosol level. There was evidence of bioturbation near this material and the date is consistent with the dates for the paleosol. The consistency in dates leads me to believe this fragment was re-deposited but dates to Component 3 at the site. If this is the case, then there is evidenced that large mammal game was also hunted during the Component 3 occupation of the site. Figure 5.7 shows the location of *in situ* faunal materials for Component 3.

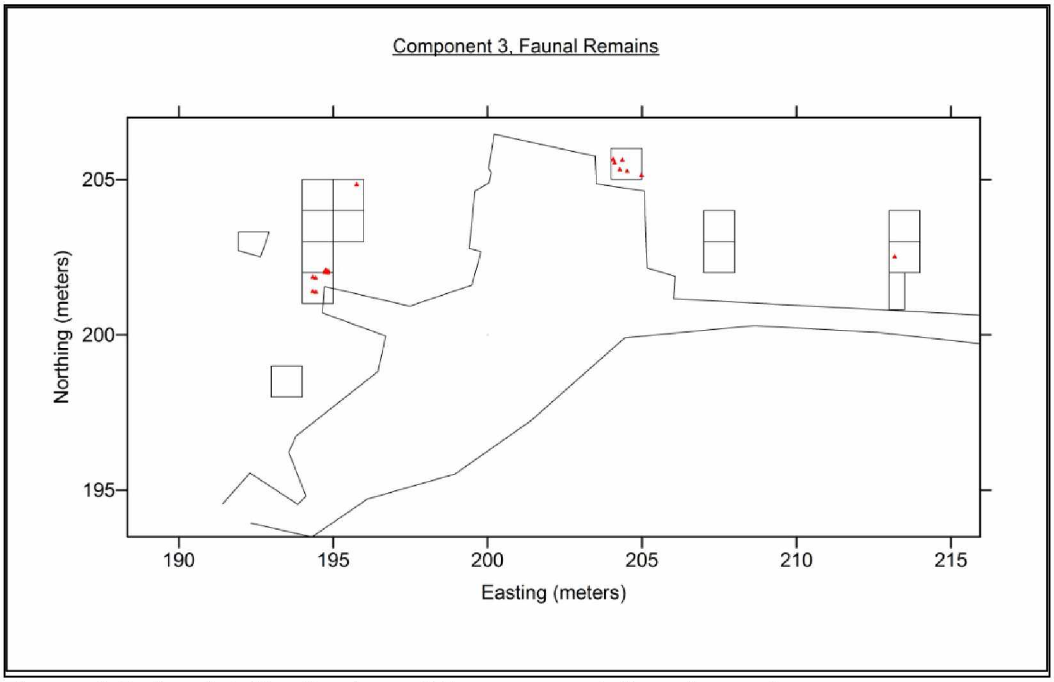

Figure 5.7. Spatial distribution of Component 3 faunal remains.

Component 4 Faunal Remains

Caribou elements make up the identifiable taxa for Component 4 (Figure 5.8). A molar and seven caribou non articulated vertebra were recovered, in addition to a single caribou molar (weighting 2.33 g.). A small unidentifiable mammal ulna (weighing 1.9 g. with a length of 3.12 cm, width of 0.87 mm, and a thickness of 0.32 mm) is also present within this component and shows signs of possible cut-marks (Figures 5.9). This ulna was not dated. Preservation of these remains within Component 4 was high. This may be attributed to being deposited later in time. Radiocarbon dates yielded from two of these vertebra dated to 2440±40 RCYB.P. (Beta-283336) (weighing 18.58 g. with a length of 5.1 cm, width of 4.41 cm, and thickness of 2.6 cm) and 2400±40 B.P. (Beta-292112) (weighing 18.87 g. with a length of 4.8 cm, width of 4.31 cm, and a thickness of 1.9 cm). These remains lie almost directly below the upper and unidentified tephra. Figure 5.10 shows the spatial distribution of Component 4 faunal remains.

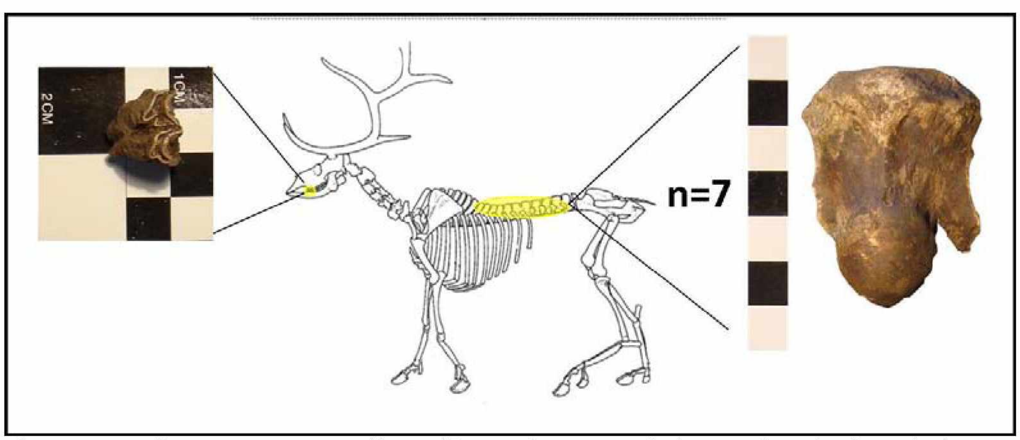

Figure 5.8. Component 4 caribou (*Rangifer tarandus*) remains, before dating.

Figure 5.9. Small mammal ulna with cut marks, 10x. Associated with Component 4 at Teklanika West

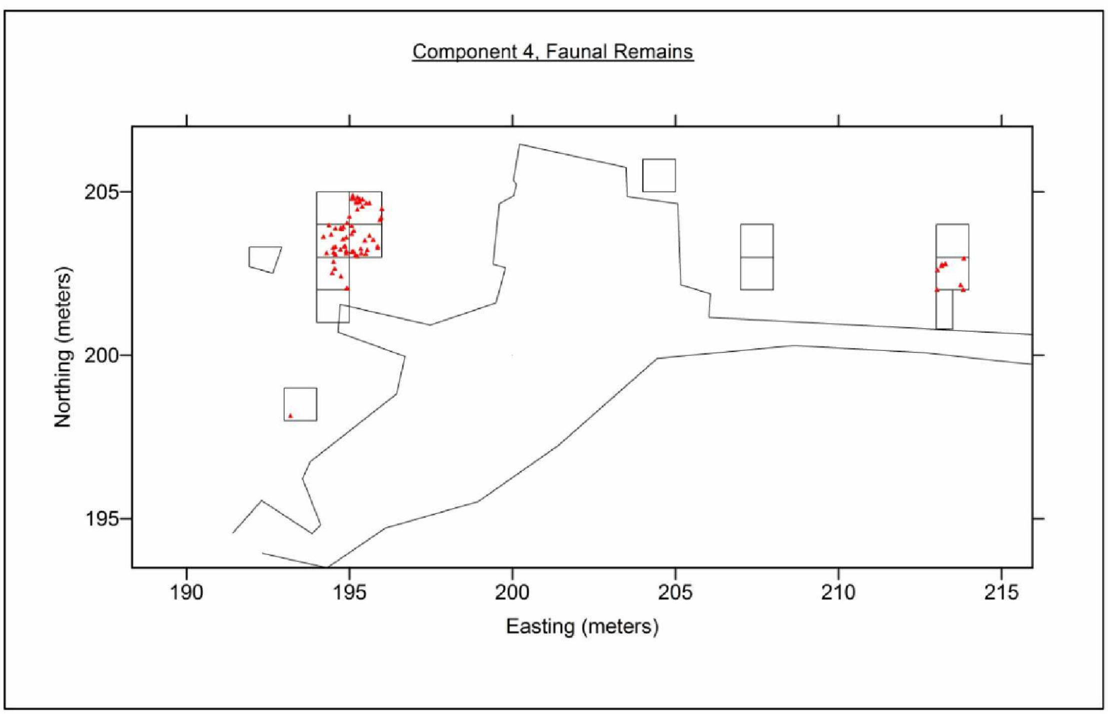

Figure 5.10. Spatial distribution of Component 4 faunal remains.

Component 5 Faunal Remains

The last component at the site, Component 5, consists largely of unidentifiable faunal remains, all with the exception of two elements. A Dall sheep (*Ovis dalli*) metapodial (weighing 23.62 g. with a length of 9.76 cm, width of 4.23 cm, and a thickness of 2.04 cm) (Figures 5.11 and 5.12) radiocarbon dated to 1450 ±50 RCYB.P. (Beta-283335) and a Dall sheep hoof fragment, not dated. In addition to these remains, there were n=76 horn fragments ranging in size from 1mm to 1cm. Figure 5.13 shows the spatial distribution of Component 5 faunal remains.

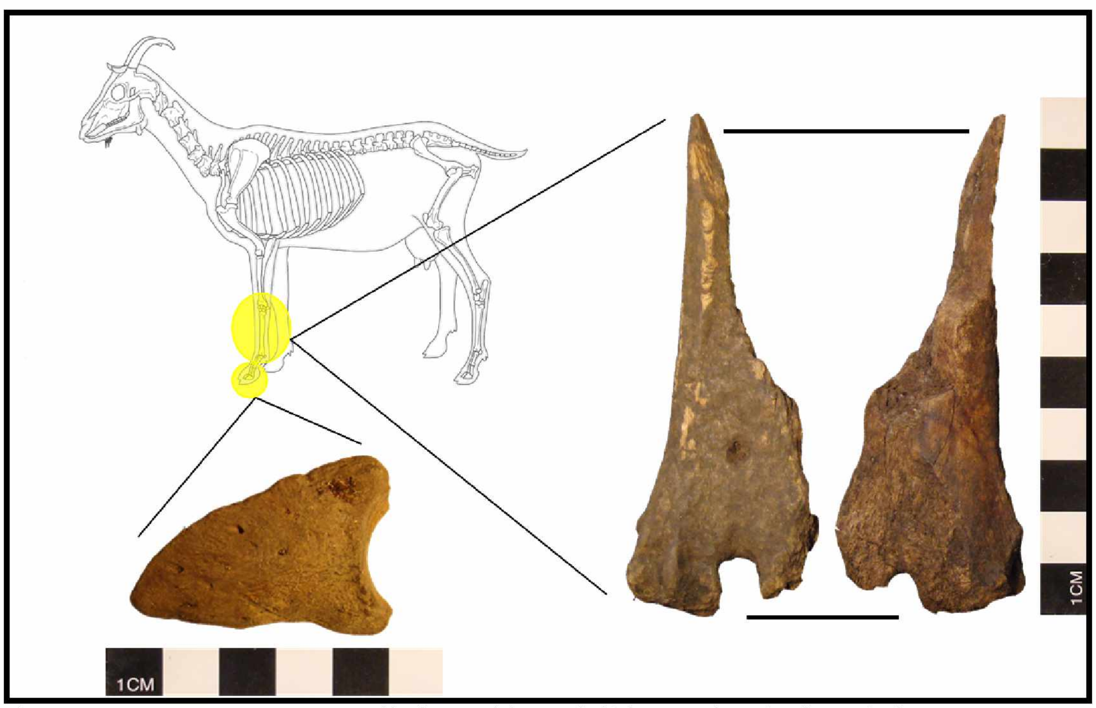

Figure 5.11. Component 5 Dall sheep (*Ovis dalli*) remains, before dating.

Figure 5.12. Dall sheep metapodial *in situ*.

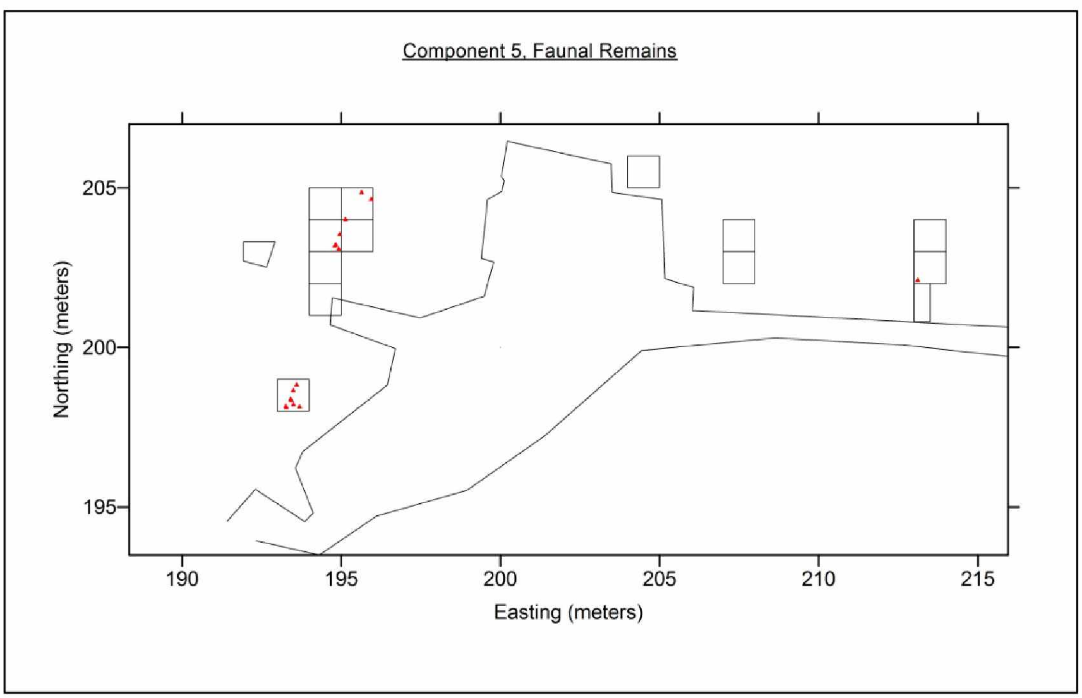

Figure 5.13. Spatial distribution of Component 5 faunal remains.

Discussion

Faunal remains are the primary source material for interpreting subsistence patterns among hunter-gatherers (Bonnichsen 1973:9; Kelly 1995; Potter 2007; Skeete 2008; Yesner 1989). Moreover, before bone data can be understood, the kinds of cultural and natural filters (cf. Lyman 1979; Reed 1963) through which they passed must be understood (Bonnichsen 1973:13). Thus, it is imperative to understand and address the transformation from living creatures, to prey species, to butchering, and finally the systemic context of such remains within the archaeological record (Lyman 1979; Klein and Cruz-Uribe 1984; Reitz and Wing 2002). By understanding all of these transformation processes, the archaeologist is better suited to addressing the relationship between the faunal and artifact assemblages.

For a number of reasons, there is little doubt that Component 1 level bones, those of bison (*Bison* sp.) are associated with the artifact assemblage and represent butchering by hunter-gatherers. This argument is supported by the fact that, both lithic and faunal remains occur in a stratigraphic/geomorphic setting, which would have made it difficult for these remains to be transported and/or re-deposited on the site by natural processes. The majority of faunal remains came from block 4, (granted the largest block), however, the area in which this block lays is relatively flat and at the top of the bluff. The fact that large amounts of faunal remains were not found in blocks 1, 2, and 3 indicates to me that there was little transportation of these remains by post depositional movement (e.g. gravity, water erosion etc…). Moreover, these remains are spatially associated with lithic concentrations and tools indicate to me a clear non-random association. Though faunal remains do not show any sign of cut marks, large bone elements are present, suggesting an emphasis was placed on high yield elements, and that these elements were brought back to the site. Lastly, krotovinas and other bioturbation were not observed in block 3 and the block 4 extension, and occur only slightly in block 1. The fact that these disturbances is marginal, at best, suggests that the Component 1 lithic and faunal remains are associated and represent a late Pleistocene occupation at Teklanika West.

Faunal remains from Component 2 are certainly more difficult to sort out. Bison (*Bison* sp.) are associated with the artifact assemblage and might represent butchering by hunter-gatherers. This argument is not as well supported as Component 1 was. Again, both lithic and faunal remains from Component 2 occur in a stratigraphic/geomorphic setting, which would have made it difficult for these remains to be transported and/or re-deposited on the site by natural processes. The majority of faunal remains come from block 4. Though these remains are spatially associated with lithic concentrations and tools, there is not distinct clustering of faunal remains, but rather these remains are spread apart. Interestingly, these faunal remains from block 4 all seem to be predominately in the northern half of the units, possibly suggesting an area where more faunal remains may be found during a future excavation. Faunal remains do not show any sign of cut marks or cultural breaking. Long bone fragments make up the majority of semi-identifiable elements from this component. I infer this to represent that an emphasis was placed on high yield elements again, and that these elements were brought back to the site. Lastly, krotovinas and other bioturbation were observed more frequently within all blocks at levels believed to be associated with Component 2. The fact that these disturbances are present may suggest mixing of artifacts and faunal materials from Components 1 and 3. Moreover, there is some evidence of cryoturbation occurring, too. If artifact mixing did occur, I would suggest that cryoturbation played more of role in moving and re-depositing artifacts, than bioturbation. The reason for this is because Component 1 raw material consists mainly of basalt and there is roughly a 5 cm level between these two components, whereas, cherts are more common in Components 2 and 3. The only main difference is that there is more basalt and rhyolite in Component 3. Based on bone collagen dating, Component 2 dates right to the Pleistocene/Holocene boundary at about 8800 B.P.. An alternative explanation to this is that there are multiple palimpsests that comprise Component 2.

Component 3 level bones, consist entirely of fragmentary remains. This may have been due to preservation issues at this level. Wood identification of charcoal from the paleosol yielded a spruce (*Picea* sp.). This species is consistent with the boreal forest (Bigelow 1991; Lloyd et al. 2006), which contains more acidity within the soil (Rapp and Hill 2006; Dincauze 2000). This may be the reason why no identifiable elements were found, making the definition of this component largely based on the lithics rather than the faunal assemblage. The main defining criterion of Component 3 is its association with the paleosol within the C horizon. Other defining criteria for this component consisted of the presence of obsidian and use thereof, the more common occurrence of microblades, boulder spall scrapers, and bi-points. Raw material use is slightly different from the previous two components, too. There is more of an occurrence of rhyolite within this component. The lack of faunal remains from this component may represent a preservation issue; however, I do not think this is the case as the preservation environment is similar to that of components 1 and 2, whereas faunal remains from those components were well preserved. Additionally, faunal remains are present and preservation is high in the strata above this component. Thus, preservation I do not think is an issue.

Another possibility, and the most likely scenario, is that faunal remains may have been disturbed/previously excavated by the previous researchers. Treganza (1964:19) notes that faunal remains were recovered during the original excavations at a depth of about 82 cm below the surface. These remains were consistent with a bovine. Unfortunately, the provenience of these remains uncertain. Yet, it does seem possible that remains from this component and likely all the others represented at the site, could have been affected by the previous research conducted at the site.

Component 4 faunal remains are fairly well preserved. The identifiable elements from this component are from caribou (*Rangifer tarandus*). These remains were associated with the artifact assemblage and represent a butchering episode by hunter-gatherers. This argument is supported by the fact that both lithic and faunal remains occur in a stratigraphic/geomorphic setting, which again would have made it difficult for these remains to be transported and/or re-deposited on the site by natural processes. Faunal remains represented within this component are limited to only blocks 1 and 4. Both of these blocks are situated on relatively flat surfaces making it difficult for items to be re-deposited. Though there is more evidence of both cryoturbation and krotovinas occurring in this level, it is safe to say that Component 4 faunal remains are spatially associated with lithic concentrations and tools. There is distinct clustering of both lithic and faunal remains as well as the intermixing of the two.

Interestingly, there is a large cluster of only faunal remains in the northern area of Block 4. Where lithic remains in association with faunal material, occurs more so in the southern part of the block. Identifiable elements at Block 4 consist of seven vertebras and a single molar, all from caribou. None of these remains shows any evidence of burning or charring, nor do they have any cut marks on them. Component 4 faunal materials at Block 1 are more associated with charcoal, with only a single lithic artifact. There is no evidence of burning or charring on any of these bones at this level in block 1. However, as mentioned before, a small mammal ulna does appear to have cut marks on it (Figures 5.9). The presence of cut-marks on this would suggest human modification and utilization of small mammals. Evidence for this was observed at Carlo Creek (Bowers 1980) where

Bowers noted (1980:139) ground squirrel (*Citellus* sp.) had been culturally utilized. Therefore, the presence and consumption of small mammal resources is not out of the question. The only problem with this and the other faunal remains from block 1 is that there is a lack of cultural artifacts associated with these remains. I infer these remains to be artifactual and represent a discrete faunal processing area within Component 4. I base this judgment on the fact that there is evidence of human butchering on the ulna and that bioturbation and other disturbance factors are virtually non-existent. This indicates to me that these remains are *in situ* and were not affected post depositionally.

The presence of two separate species, caribou and small mammal, in Component 4 is interesting because this shows that the survival of low density bones is present within the site's upper components. Based on the 2009 faunal assemblage, Component 4 is the only component to have two distinct animal species represented. The presence of caribou at the site is not surprising as Charles Sheldon (1930:46) noted the high presence of caribou and Dall sheep in the area. Even today caribou still migrate from the uplands to the lowlands via the Teklanika River Valley. Given this information and the importance, caribou played in Athabascan and historic times (Skeete 2008; Yesner 1989) it seems likely that the caribou remains are artifactual and represent a hunting/butchering episode at the site. The small mammal remains and fragmentary remains from Block 1, I interpret as being cultural and relating to occupations at the site, based on similar findings at Carlo Creek (cf. Bowers 1980). Moreover, Fauna in Block 1 may represent a separate faunal processing area, separated from the Component 4 lithic maintenance areas. However, the extent at which small mammals were being consumed by hunter-gatherers at Teklanika West should be looked into further. Additionally, the dating of these small mammal remains may elaborate further on the age and context of the remains and Component 4.

The most recent component at the site, Component 5, includes faunal remains that are well preserved based on the faunal materials recovered and discussed above. The identifiable elements from this component are a Dall sheep (*Ovis dalli*) metapodial and hoof fragment. Multiple horn fragments also confirmed the presence of Dall sheep within this component. These remains were predominately associated with the artifact assemblage from Block 5, while Blocks 1 and 4 also contain faunal materials in association with artifacts. These remains represent a butchering/processing incident by hunter-gatherers. This argument is supported by the fact that both lithic and faunal remains occur together. However, unlike the other components, stratigraphic/geomorphic setting in which these two are associated is slightly skewed. Block 5, where the majority of Component 5 faunal remains were found, lies near the previously excavated area as well as the edge of the bluff with ~40° slope. It is possible that both faunal and lithic remains were transported and/or re-deposited down slope; i.e. on or near the gravel bar, due to natural processes. Additionally, due to the location of Block 5, near the bluff's edge, stratigraphic layers are difficult to identify. This makes it difficult to understand the exact context of these remains. However, these faunal remains lie almost directly under the root, which is consistent with faunal remains from Blocks 1 and 4, which also lie directly under the root mat.

There is the most evidence of cryoturbation and other post-depositional processes occurring in the O/A horizon. There is some spatial association of faunal materials with lithic artifacts in Block 5. The association of the two in Block 4 is present; however both lithics and faunal materials are separated horizontally by 20-40 cm. There is not a distinct clustering of both lithic and faunal materials in Block 1, possibly meaning that the distribution of artifacts do not extent to that part of the site. And that the majority of this component is concentrated on the top of the bluff.

None of the faunal materials from Component 5 shows any evidence of burning or charring, nor do they have any cut marks on them. Evidence for human modification is not present either. The data show that Component 5 faunal remains are artifactual and represent faunal processing within the component. I base this conclusion on the fact that, despite the fact that block 5 lies near the bluff's edge and is on a slope, the context of the faunal materials is consistent with those from blocks 1 and 4. In that, all faunal materials from this component lie directly under the root mat.

From these data, I suggest the available potential resources are similar to the present. This has implications for your analyses and for human landuse strategies (and for potential in understanding differences with later ethnographically known Athabascan landuse practices). Charles Sheldon (1930:126) stated that the upper Teklanika River Valley area provides a habitat for many sheep. Even today, Dall sheep still migrate from the uplands to the lowlands via the Sheep Pass area east of Teklanika West (NPS 2009; Jane Bryant personal communication 2009). Furthermore, ethnographically Dall sheep were hunted in the area (Gudgel-Holmes 1989). This information, in combination with the artifact assemblage I believe represents a hunting/butchering episode at the site. Faunal processing of Dall sheep occurred in Component 5.

Specific faunal quantifications (i.e. MAU, %MAU) were not computed as there was not a large enough sample size within components (NISP=1 in Component 1; NISP=1 in Component 2; NISP=0 in Component 3; NISP=2 in Component 4; and NISP=1 in Component 5). Despite this, a clearer understanding of the faunal preservation at the site was obtained. Faunal remains ranging in age from the late Pleistocene through the late Holocene are present at the site. A small number of these remains are identifiable and allowed for discernment of species. This information is useful to understanding animal/landscape interactions. In that, understanding the animal ecology provides an understanding of what the flora consisted of. Most importantly, these remains and the data generated have provided a better sense of what prehistoric humans were hunting in the vicinity around the site. The remains of bison, caribou, and Dall sheep can be interpreted to reflect (at least in part) changing subsistence patterns of Teklanika West site occupants. Cultural components 1 and 2 from Teklanika West indicate that the upper Teklanika valley was deglaciated by the late Pleistocene and supported bison and likely other mammalian species. The shift from bison and wapiti to more upland animals (caribou and Dall sheep), during different seasons, is concurrent and supported by the idea that uplands and upland resources became more attractive to hunter-gatherers during the early-middle Holocene (cf. Potter 2008), likely attributed to changes in economy and landscape evolution. The reliance more on caribou and Dall sheep during this time became more dominant, as a result of changes on the landscape possibly attributed to the spread of the Boreal forest and demise of other large mammal species.

CHAPTER 6: LITHIC ANALYSIS

Lithic artifacts offer many insights into the behavior and lifeways of mobile foragers (Andrefsky 2005; Feder 1996; Odell 2003). Understanding these behaviors through the lithic materials allowed me to tie the results of the previous analyses together while addressing the variability of lithic materials among the different components. Additionally, new theoretical approaches (i.e. lithic sourcing, lithic variability, problems of equifinality) in lithic analysis allowed for a better understanding of technology, lithic economy, and site activities. In order to accomplish this, I addressed three objectives - (1) assess the variability in the lithic toolkits among each component, by looking at tool design/types, debitage, raw materials, refitting, and the different manufacturing and maintenance patterns seen in the lithic assemblages; (2) address the organization of mobility (Binford 1977, 1979; Odell 2003) among the occupations. Since the site lies in close proximity to a local chert and obsidian source (HEA-045), obsidian sourcing, X-ray fluorescence (XRF) was important in understanding this mobility. One would expect hunter-gatherers would be utilizing these close resources. Conversely, if these raw materials had poor flaking qualities then perhaps raw materials that are more exotic may have been used at the site. (3) infer the type(s) of site activities by component, through evaluation of technological organization, use wear, site structure, and relationships with faunal remains. Additional information from technological organization, use wear, and other data will be used to address this objective. Addressing and understanding the roles of each objective will contribute broadly to the understanding of how hunter-gatherers procured and managed their toolstone at the site, while also utilizing the locally available upland resources such as Dall sheep and caribou while also utilizing different seasonal resources (i.e. migratory waterfowl, fish, toolstone).

Lithic analysis took place at the UAF archaeology lab. Previously excavated lithic artifacts from the site were not incorporated into the analysis as most of these collections lacked any comprehensive provenience information. In all a total of 825 artifacts were collected by our excavations and have been processed and were analyzed as follows.

Methods

My analysis examined attributes of tools and flaked debris at the Teklanika West site. Tools are defined as items that were used and are distinguished from flaked debris or from being utilized. Attributes analyzed include raw material type, degree of dorsal cortex, platform preparation, metrics, and weight for all artifacts, these were basic variables described by a number of researchers (cf. Ahler 1989; Andrefsky 2005; Carr and Bradbury 2001; Mauldin and Amick 1989; Magne and Pokotylo 1981; Odell 1989. Tools were further analyzed according to edge angle, condition, and retouch attributes that included retouch form, location, and number of retouched margins (cf. Ahler 1971; Greiser 1977. Tool assemblages were further distinguished by formal and informal varieties.

Raw materials were analyzed based on visual inspection of material type, color, and texture. The degree of cortex was measured by estimating the percentage of the dorsal surface area with cortex and classifying these in five categories ranging from 0 to greater than 90 percent (Andrefsky 2005). Size was categorized according by using a concentric circle (at 5mm increments) template approach (Potter 2005). Platform preparation occurred into five forms including simple preparation defined as smooth or straight, complex with multiple surface facets, crushed, cortical, and unidentifiable/absent platforms (Andrefsky 2005). Debitage was classified into classes and included documentation of fragmented and complete flakes, spalls, biface-thinning flakes, this was similar to Ahler (1989). I included microblades into the debitage analysis as they are the bi-products of core and unless they were retouched and/or utilized they are debitage. Refitting debitage was also attempted, but was not effective due to only three refits.

Tool metrics included length, width, and thickness measured with a set of calipers. Weights to the nearest 0.1-g were taken with a digital scale. Edge angles were documented to the nearest degree with a goniometer. Retouched margins were scored based on the number of tool margins showing signs of retouch. The retouch location was classified according to where retouch occurred on the tool, and retouch form included stepped, scalar, marginal grinding, use wear only, or other (Andrefsky 2005; Odell 2003; Kelly 1988). Such variables assisted in answering the proposed projects objectives concerning lithic technology, reduction strategies, raw material acquisition, and possible conservation of raw materials.

Other tools such as cores and microcores underwent similar analyses with slightly adapted metric and non-metric variables generally following Owen (1988). Variables that included length and width of the platform, length and width of cores have also been taken. Lithic refitting of cores was performed to identify ways in which cores at the site were produced.

Cultural materials and features were mapped using *Surfer 8* to identify artifact concentrations and activity areas within the site. These analyses were useful in understanding spatial organization at the site and sites activities, while aiding in identifying components of the site. Ultimately, all of these analyses expanded upon the spatial organization and structure of the site.

Component 1 Lithics

The lowermost component, consists of well-preserved faunal remains, debitage, and both bifacial and unifacial technology (sum=83; tools=4;5%; debitage=79; 95%). Bifaces (n=3; 3% of Component 1 assemblage) and the uniface (n=1; 2% of Component 1 assemblage) are photographed (cf. Figures 6.5-6.7) . Component 1 at the site is marginally extensive throughout the site, with artifacts from this component occurring in all the blocks except for Block 5. Debitage (n=79; 95% of the Component 1 lithic assemblage), the bi-products of tool production/maintenance, comprises the majority of lithic artifacts from Component 1.

Figures 6.1-6.4 and Tables 6.1a and 6.1b summarize the debitage recovered from Component 1. Unutilized tertiary flakes (n=64; 76%) dominate the assemblage. Interestingly there is a high number of biface-thinning flakes (n=7; 8.9%) which occur in Component 1. This highest number of biface thinning flakes in all of the components and suggests that bifacial technology was emphasized and that bifaces were being manufactured.

Table 6.1a Component 1 lithic debitage.

Debitage Category	Count	%
Flake Fragment	20	25.3
Complete Flake	56	70.9
Angular Shatter	3	4
TOTAL	79	100

Table 6.1. Component 1 lithic debitage.

Debitage Category	Count	%
Tertiray Flake Fragment	20	25.3
Tertiary Flake	44	55.7
Biface Thinning Flake	7	8.9
Angular Shatter	3	3.8
Primary Cortical Spall	3	3.8
Secondary Cortical Spall	2	2.5
TOTAL	79	100

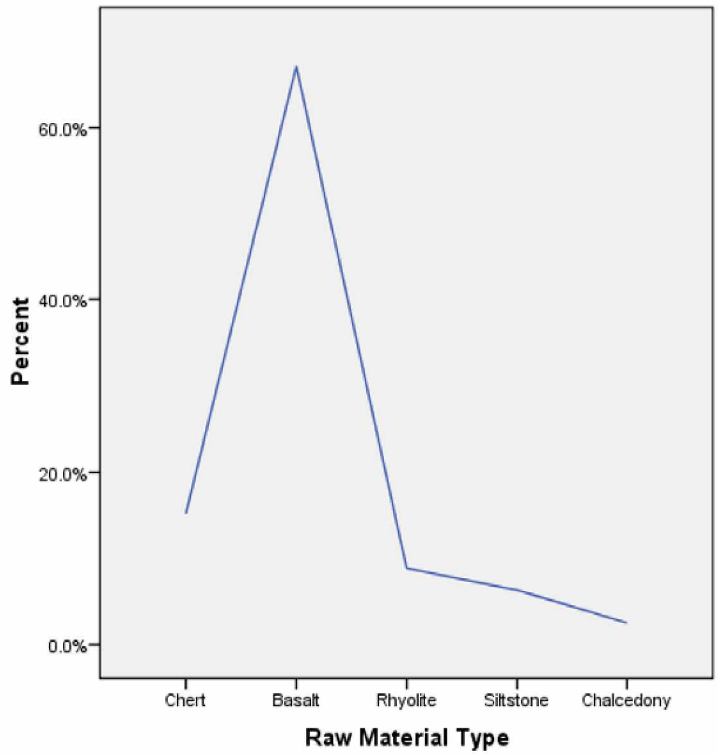

Figure 6.1 Component 1 raw materials; N=79.

Basalt is the most common raw material used within Component 1. This is followed by chert and rhyolite. Siltstone and chalcedony are also present but in low quantities.

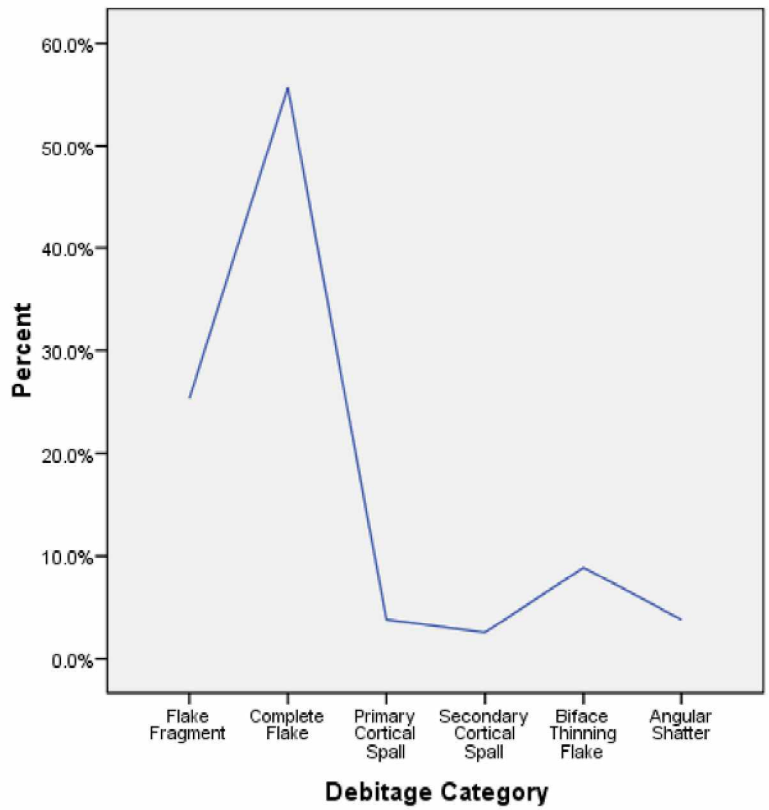

Figure 6.2. Component 1 debitage category; N=79.

Component 1 debitage categories are illustrated in Figure 6.2. Flake fragments, those flakes that do not have a proximal end, and complete flakes make up the majority of debitage from Component 1. Biface thinning flakes are the second most common, with angular shatter and cortical spalls.

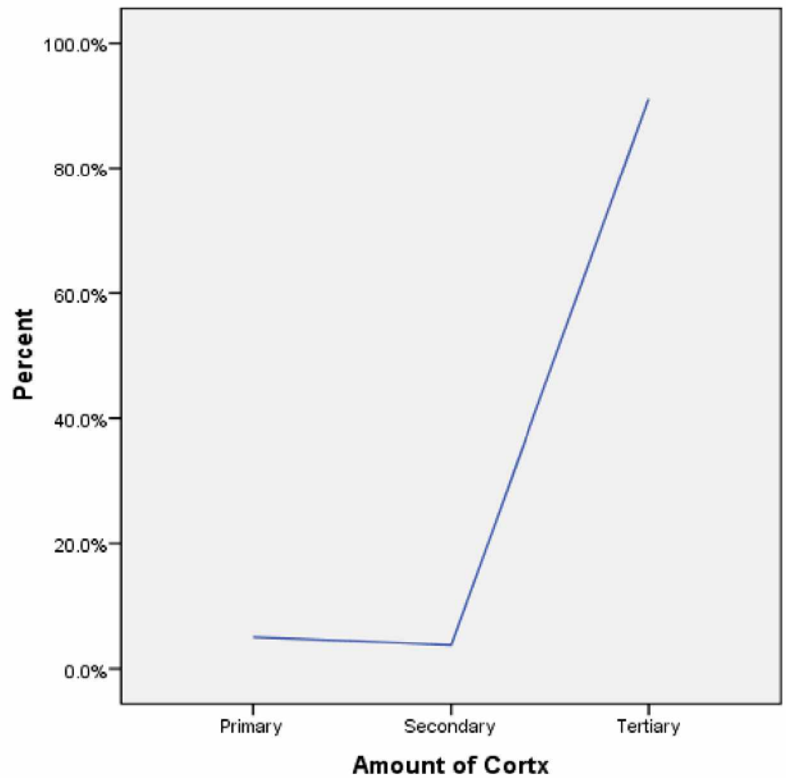

Figure 6.3. Component 1 amount of cortex; N=79

Tertiary debitage, debitage, which does not have any cortex, makes up almost a 100% of the debitage assemblage from Component 1. Primary cortical spalls are slightly more common than secondary cortical spall, those with less than 50% cortex present.

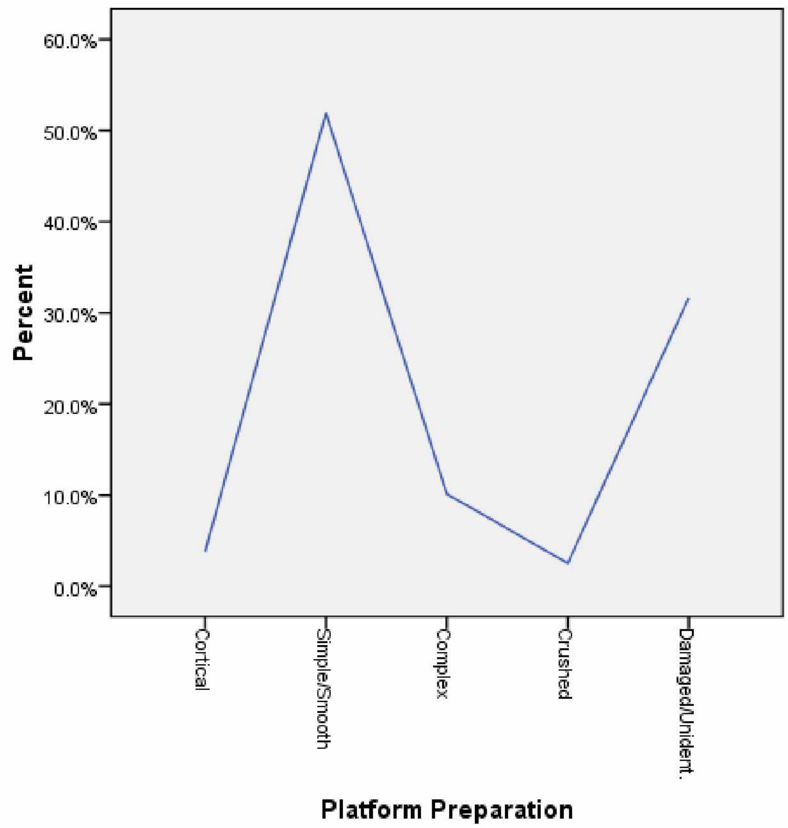

Figure 6.4. Component 1 platform preparation; N=79.

The majority of debitage from Component 1 contains simple or smooth platforms, platforms with one facet. The second most common type of platform is the complex platform, 2 or more facets. This corresponds well with the higher number of biface thinning flakes present within the debitage assemblage.

These data suggest weapons maintenance occurring within Component 1 debitage. There majority of debitage is terriary flakes with simple platforms. There were seven biface thinning flakes from this component, the highest of all of the components and suggest either biface production and/or maintenance.

Bifacial Technology

The bifacial industry of Component 1 is largely comprised of a single mid-stage biface and a lanceolate projectile point base fragment, Table 6.2 and Figures 6.5 and 6.6. The two bifaces are mid-stage bifacial knifes. Flaking on this biface is regular and produced on basalt. The lanceolate projectile point base fragment is semi-collaterally flaked and is heavily edge ground. This artifact may be intrusive into this component since Component 2 contains three similar projectile point bases. However, Component 2 is distinguished largely on the fact that chert dominates the assemblage. Moreover, spatial patterning of raw material shows a cluster of basalt artifacts in Block 4 isolated from the Component 2 chert debitage and artifacts. Based on spatial patterning and raw material use within either component, this projectile point base may indeed be part of the Component 1 assemblage.

Table 6.2. Component 1 biface summary data. *=incomplete.

FS#	Strat.	Length (cm)	Width (cm)	Thickness (cm)	Edge Angle	Description
FS41; N202E213; Fig. 6.8	C horizon	5.95*	5.64	1.25	42	Knife/thinned biface; randomly flaked, with marginal flaking. basalt
FS275; N201E194; Fig. 6.8	C horizon	2.41*	2	0.7	26	Projectile point fragment (base); collaterally flaked with marginal trimming, heavily edge ground and weathered. basalt

.
Figure 6.5 Bifaces from Component1

Figure 6.6. Bifaces from Component 1.

Unifacial Technology

The unifacial technology of Component 1 consists of a single chert side scraper. This side scraper is randomly flaked, in that the left margin was only initially flaked. Aside from these initial flake removals there is no evidence retouch occurring on the margin or scraper, Figure 6.7.

Figure 6.7. Side scraper from Component 1.

Dating and Spatial Analysis

There is a large clustering of artifacts in the block 4 extension, near the foot trail. Flakes within this cluster lie directly atop of bedrock and are predominately made of basalt. This cluster of artifacts was recovered *in situ* (Figure 6.8) in clear association with faunal remains of bison (*Bison* sp.). Table 6.3, shows the radiocarbon dates of these remains, which yielded the following results for a late Pleistocene component.

Table 6.3. Radiocarbon dates from Component 1.

Lab Number	13C/12C Ratio	Conventional Age (B.P.)	Calendar Years B.P. (calB.P.)
Beta-283333	-19.8‰	10,920±50	12,828-12,941
Beta-292111	-20.0‰	11,080±50	12,753-13,117

These data suggest that sometime during the late Pleistocene, a small number of individuals visited Teklanika West. While there, these hunter-gatherers spent time manufacturing tools in the form of bifaces. There may have been other domestic activities such as meat and hide preparation, yet this remains speculative, as there was only a single side scraper. Though the debitage and lack of finished tools do not suggest this, it is plausible to further suggest meat processing to have occurred in this component, based on the faunal assemblage and its association to the lithic artifacts. If the projectile point-base fragment is part of the Component 1 assemblage it would confirm the hunting and butchering of animals in the first component. Yet, the lack of finished tools (complete and/or fragmentary) may be a result of the previous excavations recovering them. It is also possible that finished tools will have been eroded down slope into the river. Alternatively, the lack of finished tools may be a result of sampling. Other activity areas might be present at the site, but were not detected due to my sample size.

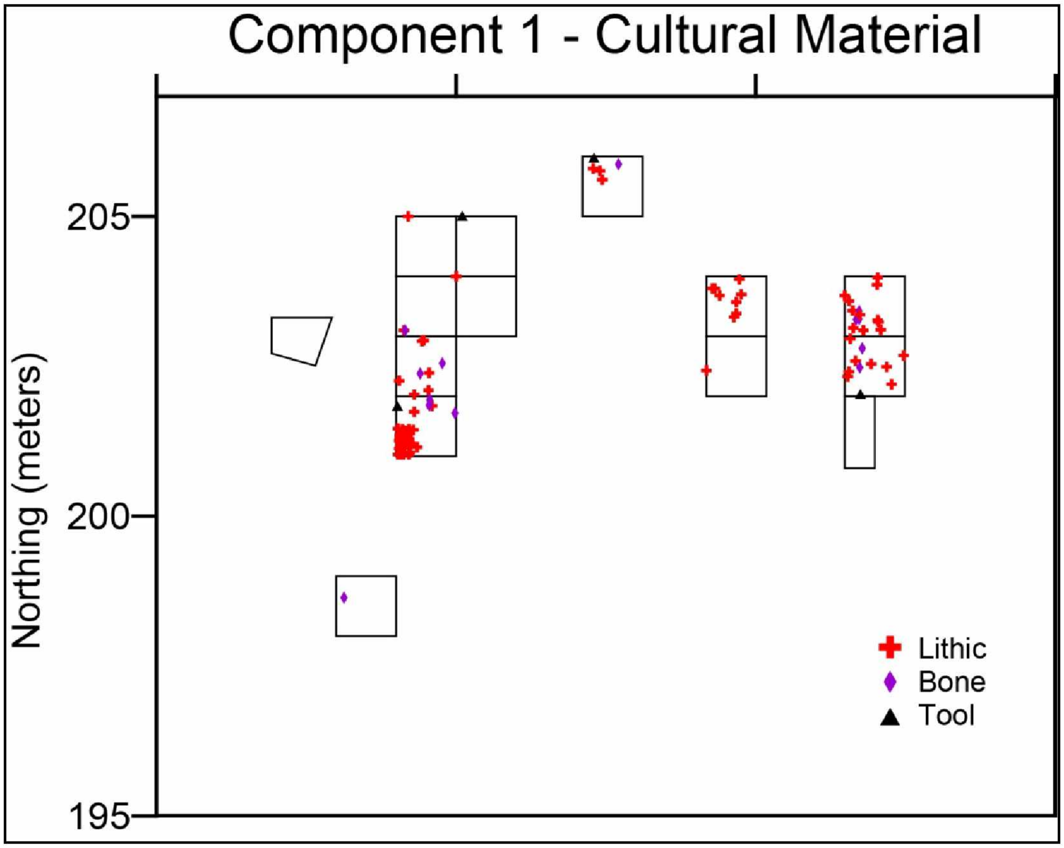

Figure 6.8. Component 1 artifacts.

Component 2 Lithics

Lithic materials from Component 2 of the site are well represented and have close association with faunal materials, bison (*Bison* sp.). These remains have been radiocarbon dated to 8820±40 B.P. (Beta-283334) and 9740±50 B.P. (Beta-292109). Debitage from Component 2 is dominated by chert (n=93; 51%) artifacts. Followed by basalt (n=33; 18%), rhyolite (n=14; 8%), and other raw materials (n=14; 8%). Some of the basalt artifacts are most likely intrusive artifacts from Component 1, as they overlap spatially with artifacts clusters from Component 1. The majority of chert artifacts, I believe represents the Component

2 lithic assemblage. The chert is a mix of local grey-greenish chert, which occurs within the chert dike below the site. The other form of chert is slightly bluish-grey and may originate from either the Teklanika East site or from the Sheep Pass area, further east of Teklanika East.

Of the five components represented at the site, Component 2 contains the largest number of tools (n=12; 7% of the total Component 2 lithic assemblage). Bifaces make up the majority of these tool (n=7; 58%), unifaces (n=3; 25%), and utilized microblades (n=2; 17%). Tables 6.4a and 6.4b and Figures 6.9-6.12, summarize the debitage recovered from Component 2. This component contains the highest number of cortical spalls and spall fragments (n=10; 7%) in addition to angular shatter (n=14; 10%) than any other component at the site. This seems to indicate there was a fair amount of initial lithic reduction of cobbles occurring at the site within this component.

Table 6.4a. Component 2 lithic debitage.

Debitage Category	Count	%
Flake Fragment	49	33.3
Complete Flake	84	57.2
Angular Shatter	14	9.5
TOTAL	147	100

Table 6.4b. Component 2 Lithic Debitage.

Debitage Category	Count	%
Tertiray Flake Fragment	39	26.5
Tertiary Flake	75	51.0
Microblade/Blade-like Flake	2	1.4
Biface Thinning Flake	2	1.4
Angular Shatter	14	9.5
Primary Cortical Spall	3	2.0
Secondary Cortical Spall	2	1.4
Cortical Spall Fragment	5	3.4
Cobble Fragment	5	3.4
TOTAL	147	100

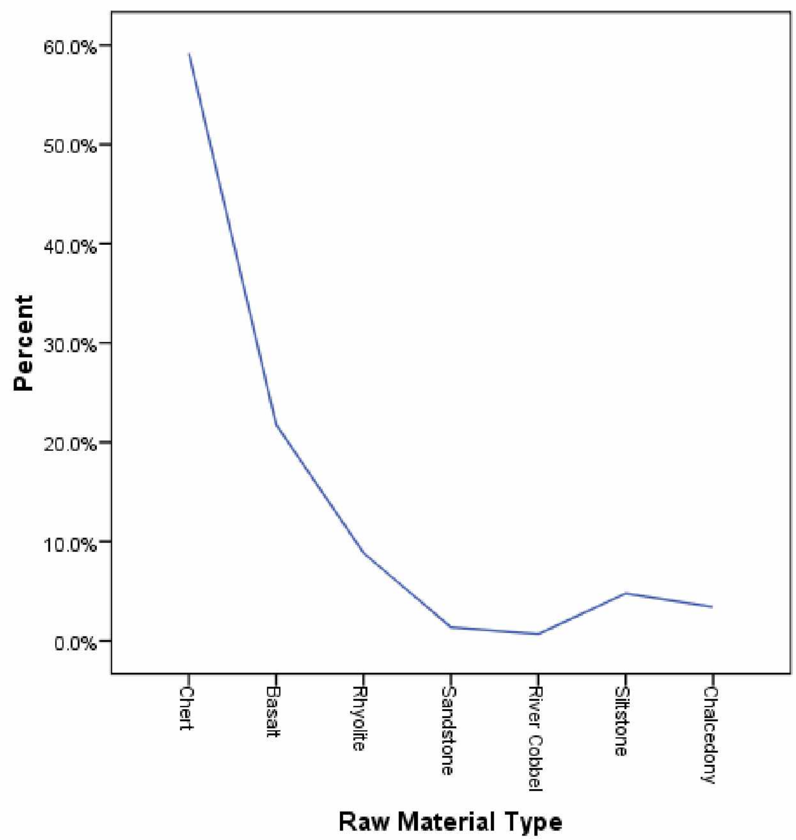

Figure 6.9. Component 2 raw materials.

Chert is the most common raw material used within Component 2. This is followed by basalt and rhyolite. Sandstone, unaltered river cobbles, siltstone, and chalcedony are also present, but in low quantities.

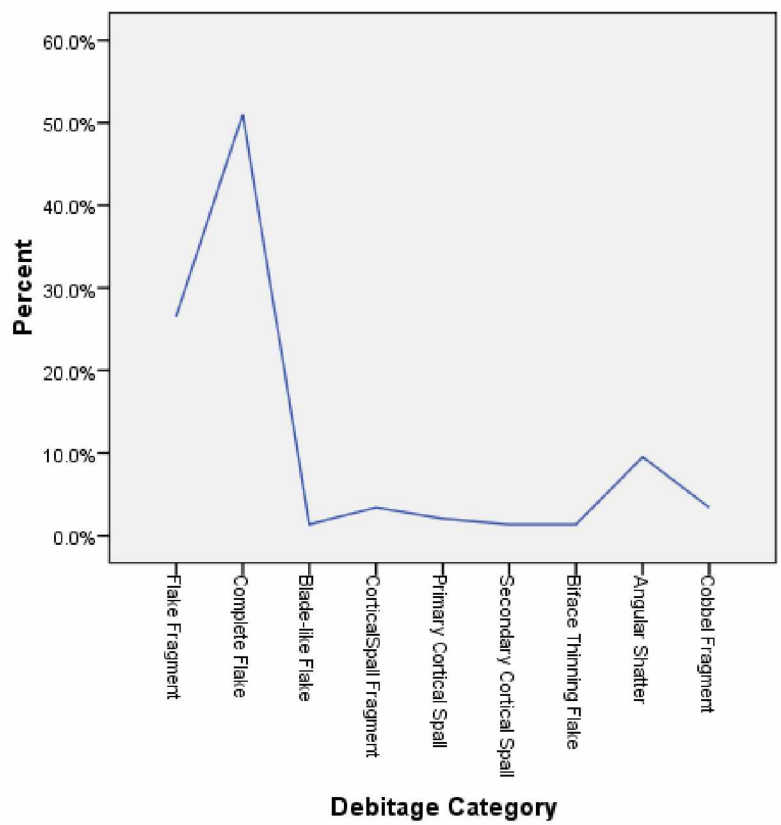

Figure 6.10. Component 2 debitage category.

Both flake fragments and complete flakes comprise the majority of debitage from Component 2. Angular shatter is the second most common form of debitage within this component. Cortical spalls and spall fragments follow this. Other debitage categories follow this, but in smaller quantities.

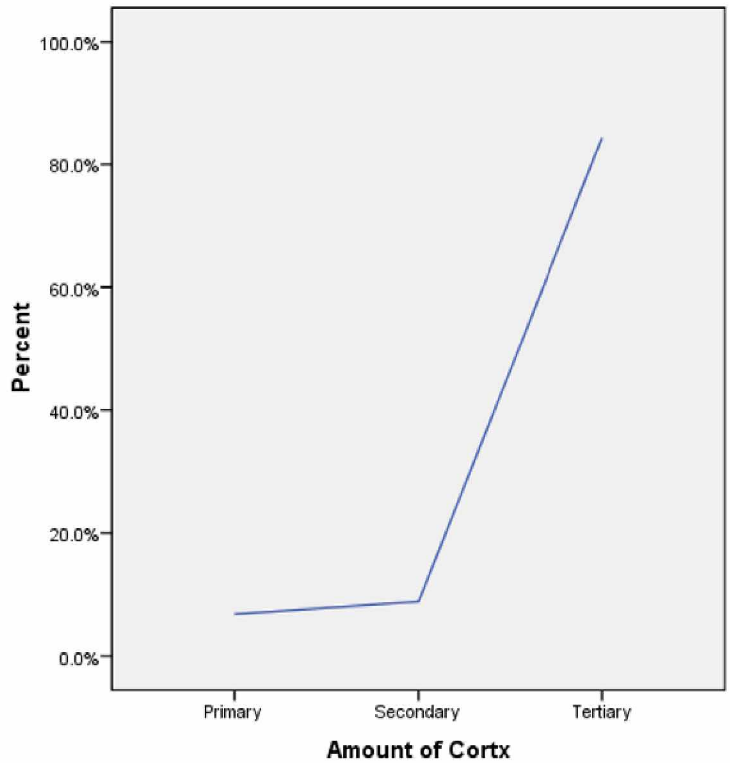

Figure 6.11. Component 2 amount of cortex.

Tertiary debitage, similar to Component 1, makes up 85% of the debitage assemblage from Component 2. Secondary cortical spalls are slightly more common than primary cortical spalls. This may imply cortex had been removed at the source of the raw material and that initial reduction of raw materials had been started elsewhere and not on site.

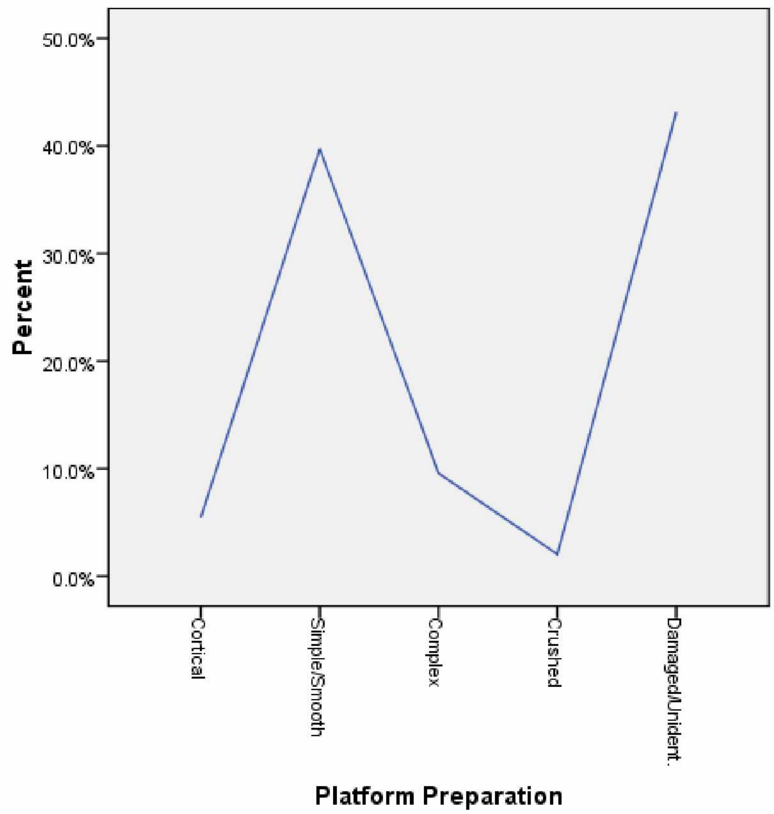

Figure 6.12. Component 2 platform preparation.

Damaged and unidentifiable platforms make up the majority of debitage from Component 2. Simple or smooth platforms are the second most common. Complex and cortical platform preparation follow these.

Bifacial Technology

The biface technology of Component 2 represents a wide array of biface stages (Table 6.5 and Figures 6.13-6.14), ranging from early stage, to mid-stage performs, to finished projectile point fragments.

Table 6.5. Component 2 biface summary data. *=incomplete.

FS#/Location	Stratum	Length (cm)	Width (cm)	Thickness (cm)	Edge Angle	Description
FS322 N203E194	C horizon	9.1	4.6	2.7	57	Early stage biface; randomly flaked. chert
FS328 N204E194	C horizon	5.4*	5.7	0.9	39	Thinned biface; randomly flaked. basalt
FS70 N205E204	C horizon	8.5*	4.54	1	35	Thinned biface; marginal trimming with overshot. chert
FS236 N203E195	C horizon, loam	6.86	2.84	0.8	30	Preform; marginal trimming. chert
FS346 N198E193	C horizon	3.8*	3.6	0.8	35	Possible perform, marginal trimming, mid-segment. chert
FS333 N198E193	Screen, C horizon	3.56*	2.2	0.6	26	Projectile point fragment (tip); collaterally flaked. chert
FS316 N203E194	C horizon	3.21*	2.5	0.8	31	Projectile point fragment (base); collaterally flaked, heavily edge ground. chert
FS217 N204E194	C horizon	2.4*	2.3	0.7	29	Projectile point fragment (base); collaterally flaked, heavily edge ground. chert
FS224 N203E194	Chorizon	3.12*	2.1	0.75	29	Projectile point fragment (base); collaterally flaked, heavily edge ground. chert

Figure 6.13. Projectile point bases from Component 2.

Figure 6.14. Component 2 bifaces

Unifacial Technology

Unifacial technology from Component 2 consists of mainly of 2 end scrapers, Figure 6.15. The first of these is field specimen 138. This is made of a slight translucent chert. The tool was made on a plunging flake with steep retouch occurring on the dorsal side of the distal end. The second end scraper is made of rhyolite. Slightly steep retouch occurs along the distal end of the artifact. The proximal end of the artifact has been broken. In addition to the two end scrapers, there is a single black chert utilized flake. This flake has been utilized along either margin of the artifact.

Figure 6.15. Component 2 unifaces.

Dating and Spatial Analysis

Component 2 artifacts cluster throughout the site, but occur mostly in block 4. Flakes within this cluster lie about 10 cm above bedrock and are predominately made of chert. Figure 6.16 shows the distribution of cultural materials from Component 2. The cluster of artifacts in blocks 1 and 4 were recovered *in situ* and were in clear association with faunal remains of bison (*Bison* sp.). Table 6.6 shows radiocarbon dating of these remains yielding the following results for a earliest Holocene component at the site. Dating of faunal remains throughout the site were all congruent with each other.

Table 6.6. Radiocarbon dates from Component 2.

Lab Number	13C/12C Ratio	Conventional Age (B.P.)	Calendar Years B.P. (calB.P.)
Beta-283334	-17.6‰	8820±40	10,150-9990 to 9960-9700
Beta-292109	-20.6‰	9740±50	10,883-11,246

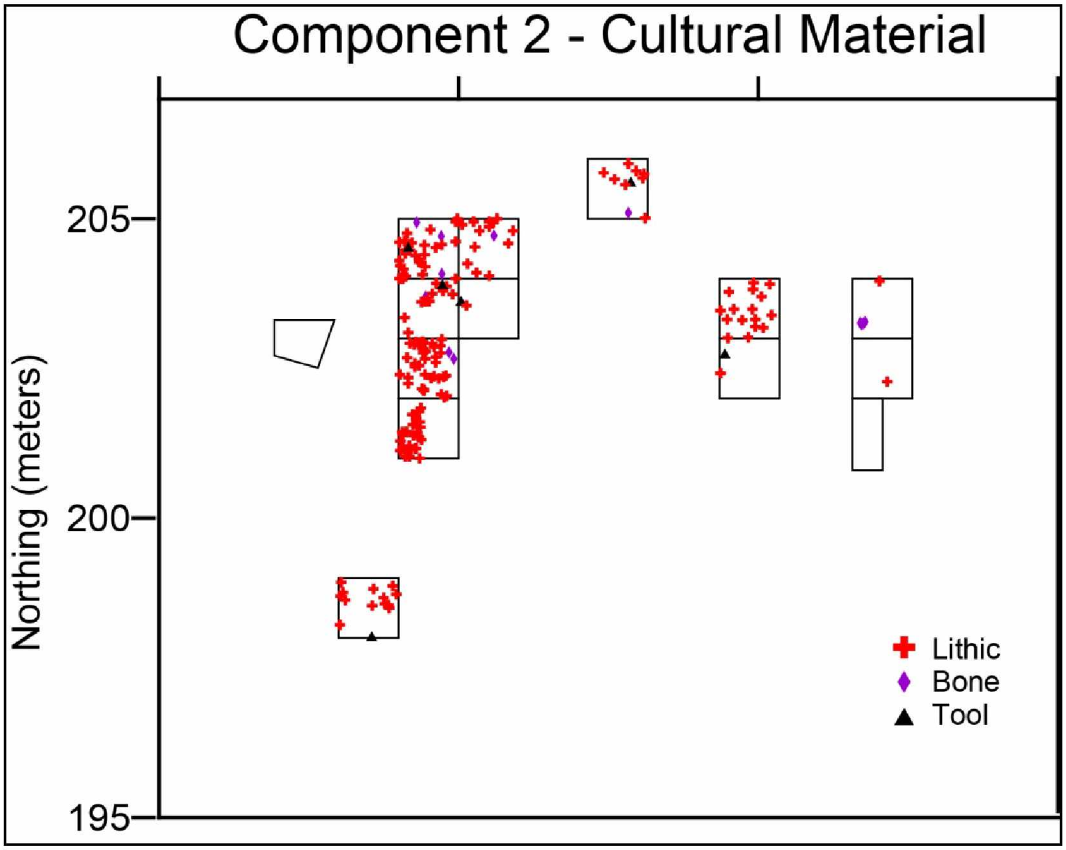

Figure 6.16. Component 2 *in situ* materials.

Discussion

Sometime during late Pleistocene/Holocene transition, a small group of hunter-gatherers visited Teklanika West. While there, these hunter-gatherers spent time processing meat and refurbishing their toolkits. This is supported by the lanceolate projectile point bases and the end scrapers. Debitage also supports this idea, as there was a large amount of cortical spalls and spall fragments. Additionally, the majority of flakes showed only a single facet. Based on the Component 2 assemblage it is plausible to further suggest meat processing to have occurred in this component, based on the faunal assemblage and its relation/association to the lithic artifacts. The projectile point-base fragments from this component confirm the hunting and the end-scrapers and retouched flake confirms the butchering of animals within this component. Other activities, which seem to have occurred, include the maintenance and refurbishing of the lithic tool kit. Additional activity areas might be present at the site, but were not detected due to my sampling strategy.

Component 3 Lithics

Component 3 at Teklanika West corresponds with the paleosol of the site, which has been directly dated to 6770±50(Beta-276455) , 7030±40 (Beta-292107), and 7130±98 (GX-18518) (date produced at the base of the paleosol) (Goebel 1996). This component is overlain by the Oshetna tephra, ranging in age of 6502-7156 cal B.P. (Addison and Beget 2010). Artifacts from Component 3 consist of both bifacial and unifacial technology. This component also contains the highest amount of microblades and tools at the site.

Debitage from Component 3 (Figures 6.17-6.20 and Tables 6.7a and 6.7b) is made up of predominately unutilized tertiary flakes. The component contains the highest number of microblades (n= 4; %) and blade-like flakes (n= 1; %). Microblades are all made of obsidian, sourced to the Batza Téna obsidian source along Kilkuk River, about 200km (124 miles) north by northwest of Teklanika West. Lastly, angular shatter makes up 10% of the debitage recovered from this component.

Table 6.7a. Component 3 lithic debitage.

Debitage Category	Count	%
Flake Fragment	49	24.8
Complete Flake	130	66.0
Angular Shatter	18	9.2
TOTAL	197	100.0

Table 6.7b. Component 3 lithic debitage.

Debitage Category	Count	%
Tertiray Flake Fragment	46	23.4
Tertiary Flake	99	50.3
Microblade/Blade-like Flake	11	5.5
Pressure Flake	2	1.0
Biface Thinning Flake	7	3.6
Angular Shatter	18	9.1
Primary Cortical Spall	6	3.0
Secondary Cortical Spall	5	2.5
Cobble Fragment	3	1.6
TOTAL	197	100

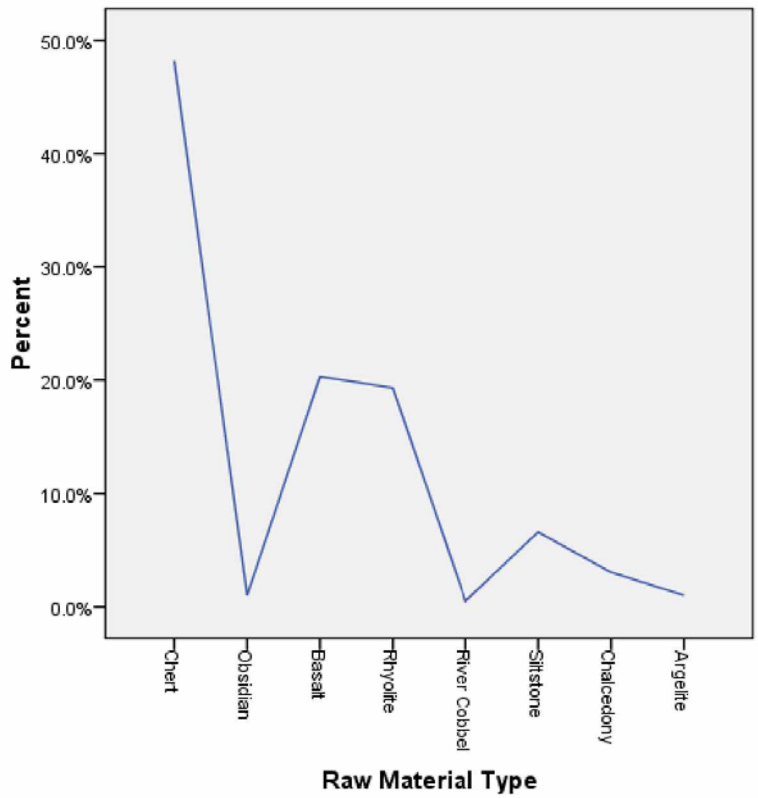

Figure 6.17. Component 3 raw materials.

Chert is the most common raw material used within Component 3. This is followed by basalt and rhyolite, almost in equal amounts. Sandstone, unaltered river cobbles, siltstone, and chalcedony are also present, but in lower quantities.

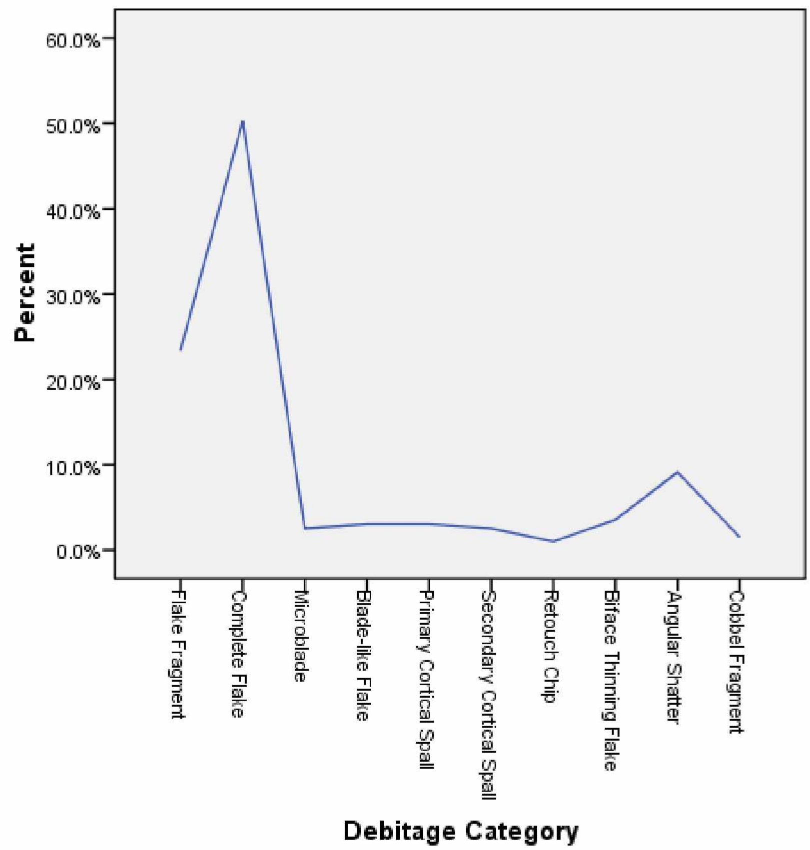

Figure 6.18. Component 3 debitage category.

Both flake fragments and complete flakes comprise the majority of debitage from Component 3. Angular shatter is the second most common form of debitage within this component. Cortical spalls and spall fragments follow this. Other debitage categories follow this, but in few quantities.

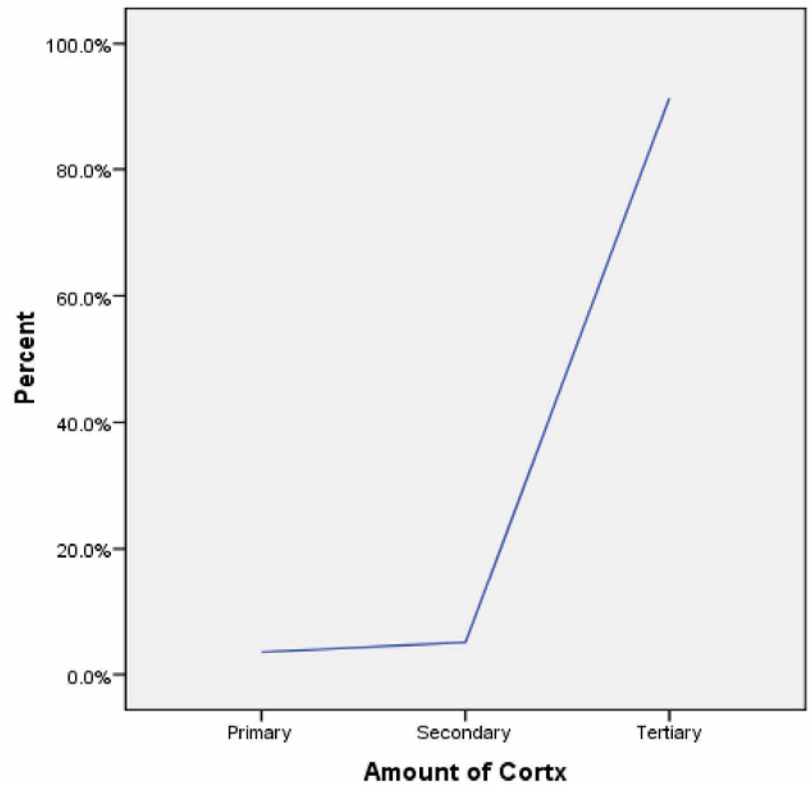

Figure 6.19. Component 3 amount of cortex.

Tertiary debitage, debitage, which does not have any cortex, makes up almost a 100% of the debitage assemblage from Component 3. Primary cortical spalls are slightly fewer than secondary cortical spall, those with less than 50% cortex present.

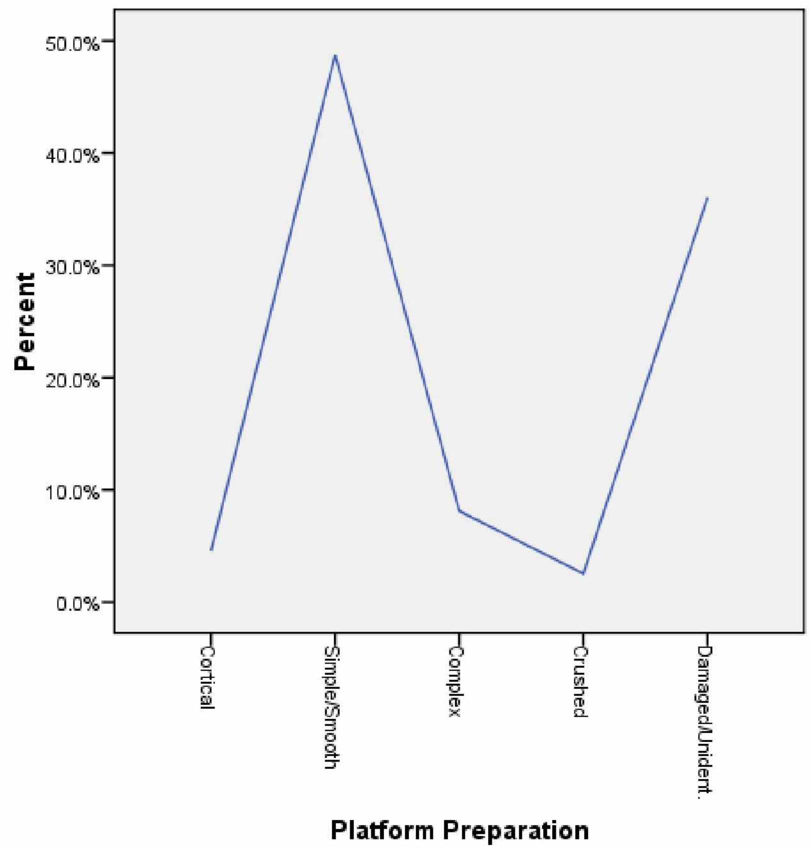

Figure 6.20. Component 3 platform preparation.

The majority of debitage from Component 3 contains simple or smooth platforms, platforms with one facet. The second most common type of platform are damaged/unidentifiable platforms. Both complex and cortical platforms are equal and not as well represented.

Bifacial Technology

The bifacial technology from Component 3 consists of six bifaces (Figures 6.21 and 6.22); four late-finished stage ovate to semi-ovate bifaces and two bi-points; one of which is a fragment. Table 6.8 summarizes the bifaces from Component 3 and includes morphometric data from these as well. The ovate bifaces are all similar in appearance and may have been used, or were to be used as knives. The two bi-points have been randomly flaked but exhibit signs of marginal trimming along either side margins.

Table 6.8. Component 3biface summary data. *=incomplete.

FS#	Strat. Location	Length (cm)	Width (cm)	Thickness (cm)	Edge Angle	Tool Description
FS268 N198E193	C horizon	5.9	2.72	1.13	37	Ovate late stage biface; randomly flaked. chert
FS67 N202E194	C horizon	4.1*	2.7	0.9	31	Ovate late stage biface/knife, marginal trimming/retouch, chert
FS198 N203E195	C horizon, loam	4.0*	3.1	0.9	34	Thinned ovate to elliptical biface; slight marginal trimming. chert
FS93 N202E194	C horizon	6.1*	2.55	0.85	32	Nearly finished biface; long and narrow, semi-ovate randomly flaked. basalt
FS135 N202E194	C horizon	5.02	1.95	0.9	32	Complete bi-point, edge ground on the left margin, random flaking to marginal trimming. chert
FS32 N205E204	C horizon, paleosol	5.0	2.35	0.8	29	Projectile point/bi-point fragment (tip); randomly flaked with some marginal trimming. chert

Figure 6.21. Bifaces from Component 3

Figure 6.22. Bi-points from Component 3.

Unifiacial Technology

Three boulder spall scrapers (Figure 6.23) were recovered from Component 3. None of these have been retouched and all were manufactured off of a river cobble. There is also a single chert end-scraper (Figure 6.24) with steep distal end retouch. This end-scraper is complete and has a single faceted platform.

Figure 6.23. Boulder spall scrapers from Component 3.


Figure 6.24. Uniface from Component 3.

Dating and Spatial Analysis

The bi-point fragment (FS32) is made of a white-cream chert. It was found in Block 3 (N205E206) and was directly associated with the paleosol of the site which has been dated to 6770±50 (Beta-276455) (Figure 6.25) and 7030±40 (Beta-292107). The additional bifaces were all recovered in similar context, either directly within the paleosol, or within a few vertical centimeters from it.

Artifacts from Component 3 were recovered throughout the site and from all the blocks (Figure 6.26). Blocks three and four contain the highest amount of artifacts, 16% and 64% respectively. There is also a large cluster of artifacts trending grid north in block 4, which may indicate a flaking station and activity area that could be explored in the future. Fragmented faunal remains were found in block one, three, and four and were associated with the cultural artifacts. The fact that these remains are so fragmented and unidentifiable may give clues to the past environmental and depositional setting of these remains.

Figure 6.25. Component 3 artifacts associated with paleosol. Paleosol charcoal yielded two AMS dates: Beta-276455 and Beta-292107.

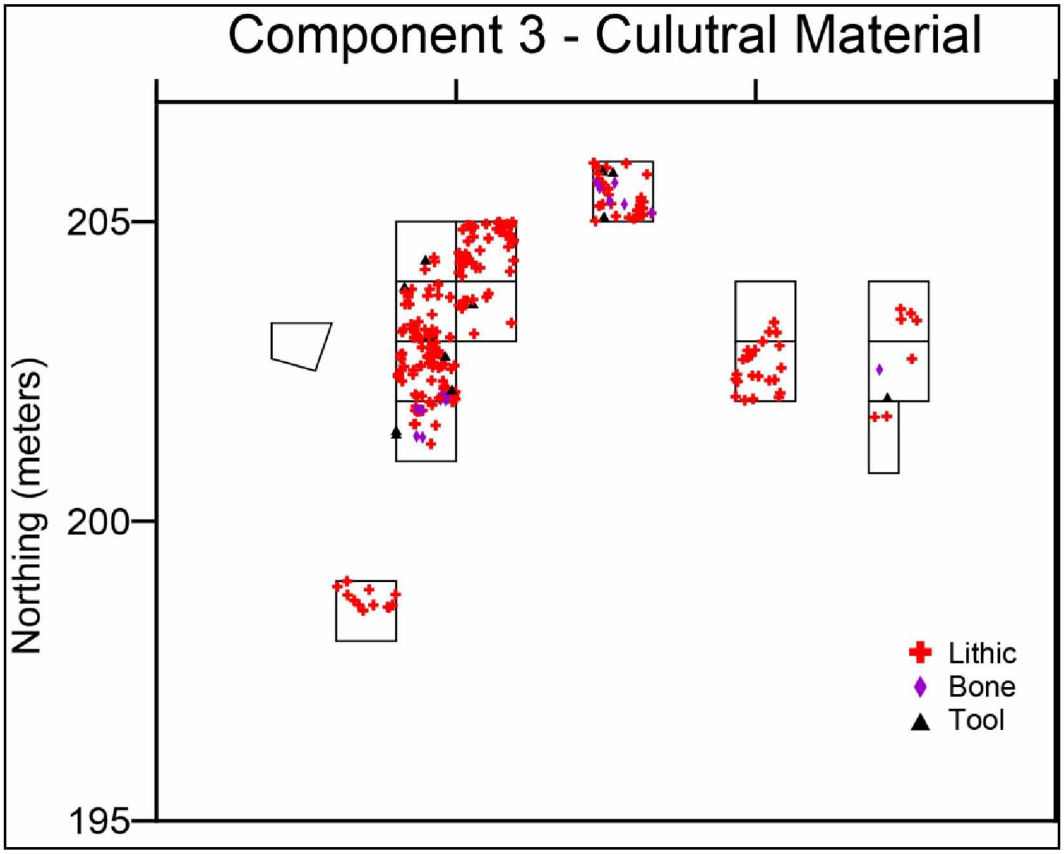

Figure 6.26. Component 3 *in situ* materials.

Discussion

These data indicate that during the early Holocene, a group of hunter-gatherers visited Teklanika West. While there, these hunter-gatherers spent time maintaining their tool-kit. Bifacial technology seems to have been emphasized within this component, due to the amount of biface fragments recovered. The extent to which meat processing occurred is for now somewhat speculative. It is possible that faunal materials were crushed for marrow rendering based on the high frequency of bone fragments. Whatever the case, domestic activities are suggested based on the unifacial tools recovered from the site, however the extent to which these activities were carried out is poorly understood. What is certain is that this component tends to be associated with the paleosol of the site. The two older components lie below the paleosol. Special attention was given to biface maintenance and production. Lastly, additional activity areas might be present at the site, but may not have been detected due to my sampling strategy.

Component 4 Lithics

Component 4, consists partially of well-preserved faunal remains, debitage, and bifacial tools. The bifaces from this component likely correspond to either Component 2 or 3 based on context and morphological data. Component 4 artifacts are found throughout the site, specifically Block 4. All of the artifacts from this component occur in the B/Bw horizon and were found below the second, younger unknown tephra.

Debitage (n=85; 80% of the Component 4 lithic assemblage), comprises the majority of lithic artifacts from Component 4. No diagnostic tools were found from this component, with the exception of the two projectile point bases believed to be intrusive from earlier components. Figures 6.27-6.30 and Tables 6.9a and 6.9b summarize the debitage recovered from Component 4. Unutilized tertiary flakes (n=159; 87%) dominate the assemblage. There are three biface-thinning flakes (n=3; 2%) occurring in this component.

Table 6.9a. Component 4 lithic debitage.

Debitage Category	Count	%
Flake Fragment	78	42.6
Complete Flake	98	53.6
Angular Shatter	7	3.8
TOTAL	183	100

Table 6.9b. Component 4 lithic debitage.

Debitage Category	Count	%
Tertiray Flake Fragment	73	39.9
Tertiary Flake	86	47.0
Biface Thinning Flake	3	1.7
Pressure Flake	6	3.3
Angular Shatter	7	3.8
Cortical Spall Fragment	1	0.5
Primary Cortical Spall	4	2.2
Secondary Cortical Spall	1	0.5
Cobbel Fragment	2	1.1
TOTAL	183	100

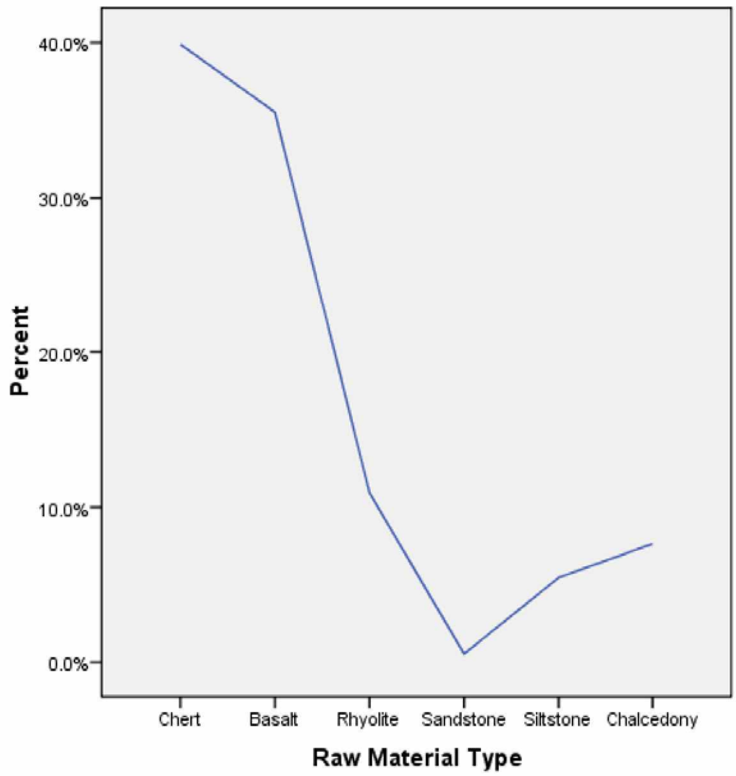

Figure 6.27. Component 4 raw materials.

Chert and basalt are the most common raw material used within Component 4. This is followed by rhyolite. Siltstone and chalcedony are present in higher quantities than sanstone.

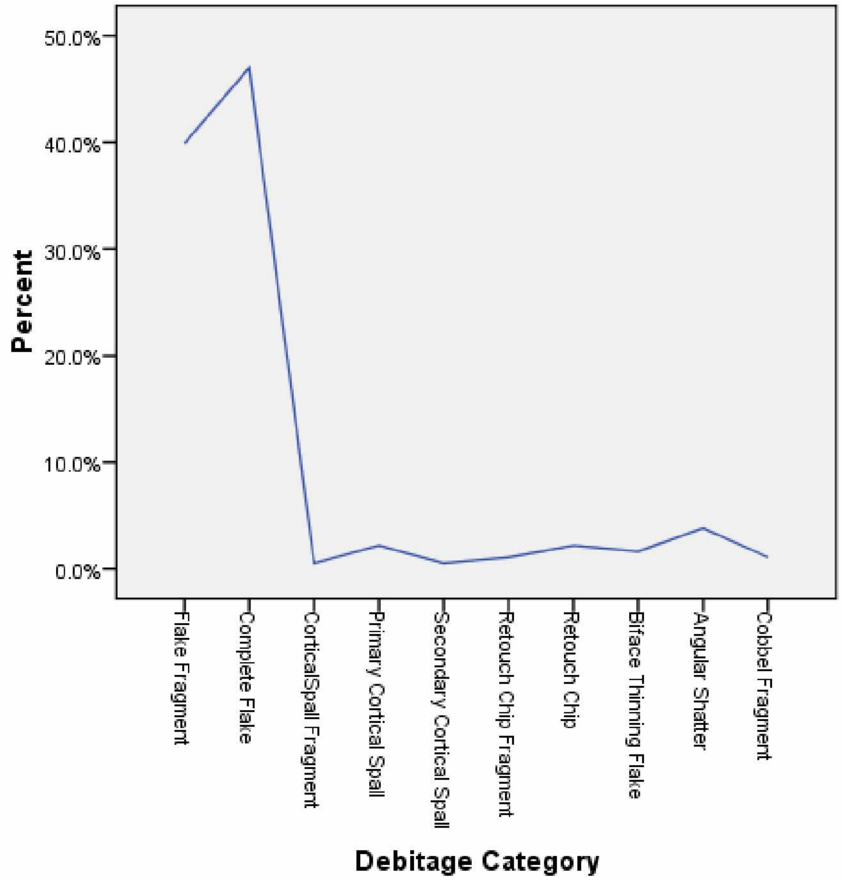

Figure 6.28. Component 4 debitage category.

Both flake fragments and complete flakes comprise the majority of debitage from Component 4. Angular shatter is the second most common form of debitage within this component. Cortical spalls and spall fragments follow this. Other debitage categories follow this, but in smaller quantities.

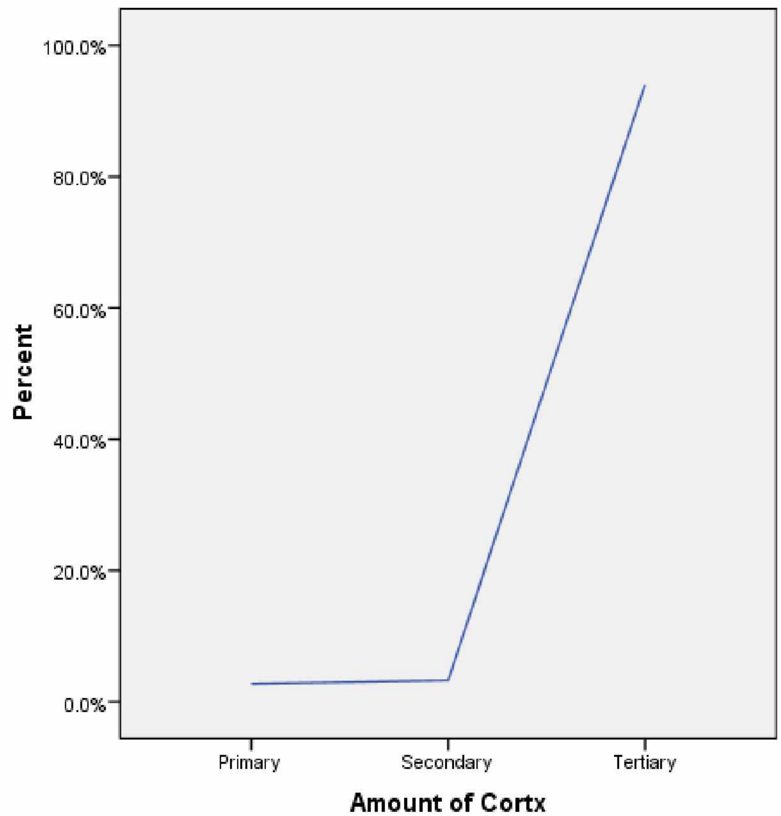

Figure 6.29. Component 4 amount of cortex.

Tertiary debitage, debitage, which does not have any cortex, makes up almost a 100% of the debitage assemblage from Component 4. Secondary cortical spalls are slightly more common than primary cortical spalls.

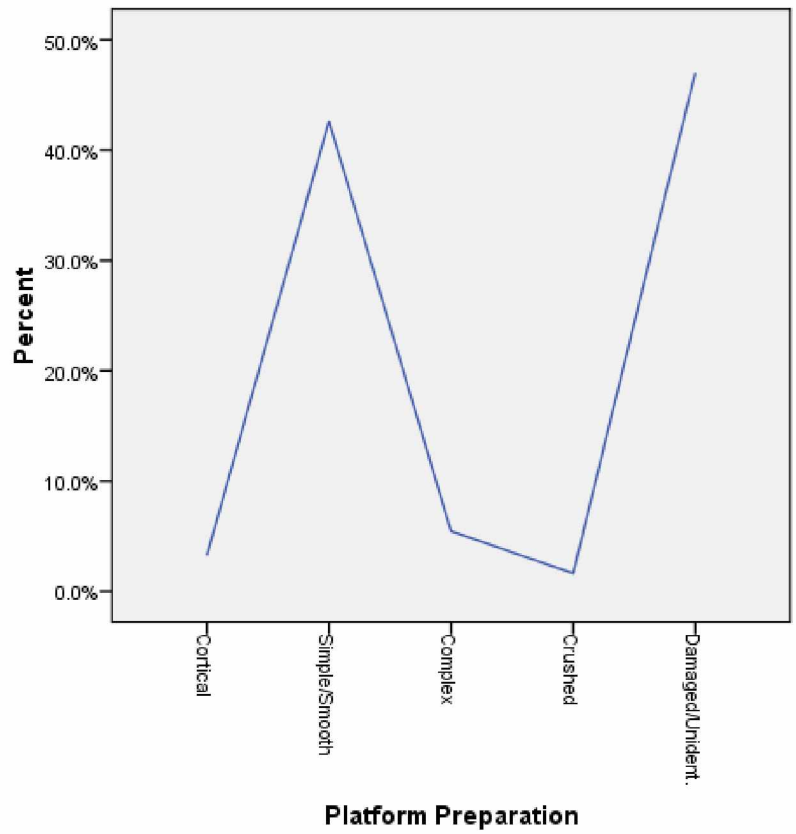

Figure 6.30. Component 4 platform preparation.

The majority of debitage from Component 4 contains damaged/unidentifiable platforms. The second most common type of platform is simple/smooth, with the complex platforms and cortical platforms following this.

Bifacial Technology

The bifacial industry of Component 4 is comprised of two lanceolate projectile point base fragments (Figure 6.31). The summary data of these are listed in Table 6.10. These two points are believed to be intrusive from either components 2 or 3 based on the presence of bioturbation near where one of the point bases was found. The other was found almost within a krotovina, suggesting again bioturbation had occurred and moved these artifacts after deposition. Additionally, both of these artifacts are made of chert similar in appearance to the projectile point bases from Component 2. Both of the lanceolate projectile point base fragments are semi-collaterally flaked and both are heavily edge ground.

Table 6.10. Component 4 biface summary data. *=incomplete.

FS#	Strat. Location	Length (cm)	Width (cm)	Thickness (cm)	Edge Angle	Tool Description
FS21; N202E194	B/Bw horizon, near krotovenia	2.4*	1.9	0.7	29	Projectile point fragment (base); collaterally flaked, with some margin trimming, heavily edge ground. chert
FS40; N201E194	B/Bw horizon, evidence of turbation	2.61*	2.15	0.8	30	Projectile point fragment (base); collaterally flaked, heavily edge ground. chert

Figure 6.31. Component 4 projectile point bases.

Unifacial Technology

There was a single retouched flake, not pictured, made of chert recovered from this component. The retouch is scalier and present on the left margin.

Dating and Spatial Analysis

Unlike some of the earlier components, there is no clear separation between raw material uses within this component. There is a large clustering of artifacts in Block 4 (Figure 6.32). It is interesting in that lithic artifacts and faunal remains are clearly associated with each other, yet there are two separate clusters of lithic and faunal remains in block 4. The faunal remains from block 4, the northern area of the block consisted of vertebra from caribou. Radiocarbon dates of these remains are shown in Table 6.11. There is a heavier concentration of lithic artifacts the closer to the trail. This separation may represent specific activity areas on the site, where stone tools were being manufactured and fauna was being processed.

Table 6.11. Radiocarbon dates from Component 4.

Lab Number	13C/12C Ratio	Conventional Age (B.P.)	Calendar Years B.P. (calB.P.)
Beta-292112	-18.1‰	2400±40	2690-2640 to 2610-2590 to 2500-2340
Beta-283336	-17.2‰	2440±40	2710-2350
Beta-292108	-23.3‰	2970±30	3250-3060

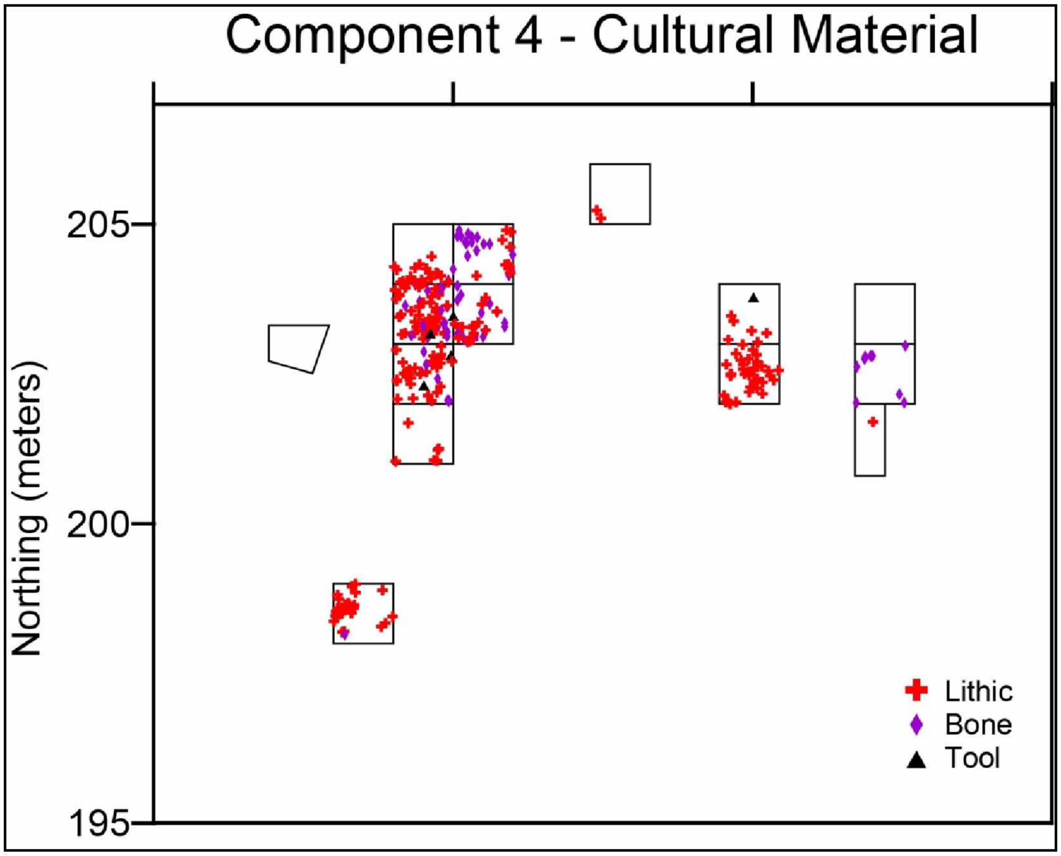

Figure 6.32. Component 4 *in situ* materials.

Component 5 Lithics

The uppermost component, consists of well-preserved faunal remains, debitage, and bifacial technology. A single biface was recovered from this component. There were no unifiaces recovered from this component. Debitage (n=65; 95.5% of the Component 5 lithic assemblage) comprises the majority of lithic artifacts from Component 5.

Figures 6.33-6.36 and Tables 6.12a and 6.12b summarize the debitage recovered from Component 5. Unutilized tertiary flakes (n=53; 82%) dominate the assemblage. Interestingly there is a fairly higher number of retouch chips (n=5; 8%) which occur within this component. This is the highest number of retouch chips in all of the components and suggests that near finished stone tools were being manufactured within this component.

Table 6.12a. Component 5 lithic debitage

Debitage Category	Count	%
Flake Fragment	28	43.0
Complete Flake	35	53.9
Angular Shatter	2	3.0
TOTAL	65	100

Table 6.12b. Component 5 lithic debitage.

Debitage Category	Count	%
Tertiray Flake Fragment	24	36.9
Tertiary Flake	29	44.6
Pressure Flake	8	12.3
Angular Shatter	2	3.1
Cortical Spall Fragment	1	1.5
Primary Cortical Spall	1	1.5
TOTAL	65	100

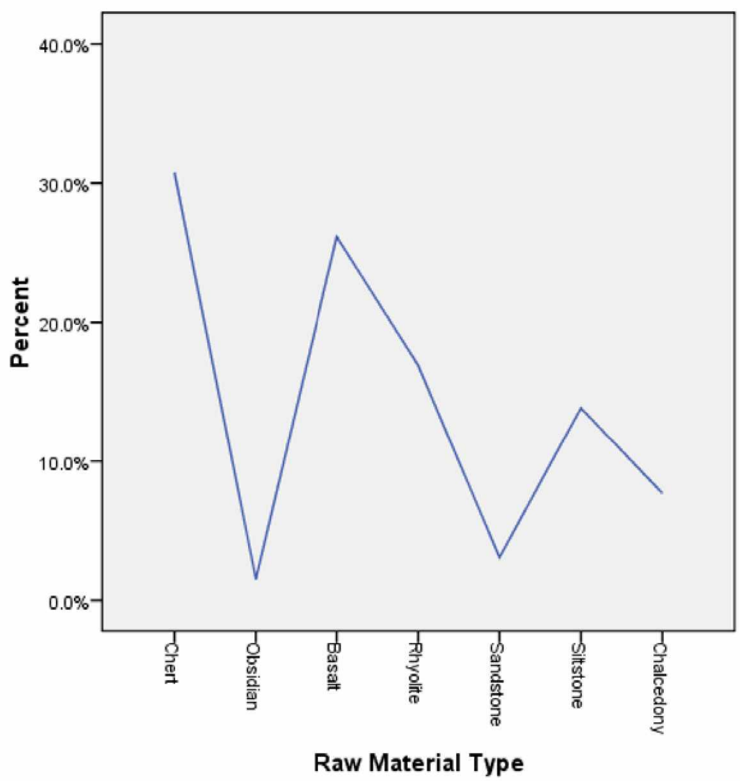

Figure 6.33. Component 5 raw materials.

Chert is the most common raw material used within Component 5. This is followed by basalt and rhyolite. Siltstone and chalcedony are also present and in high quantities. Sandstone is present in low quantities. And obsidian is also present. This has been sourced to Batza Tena.

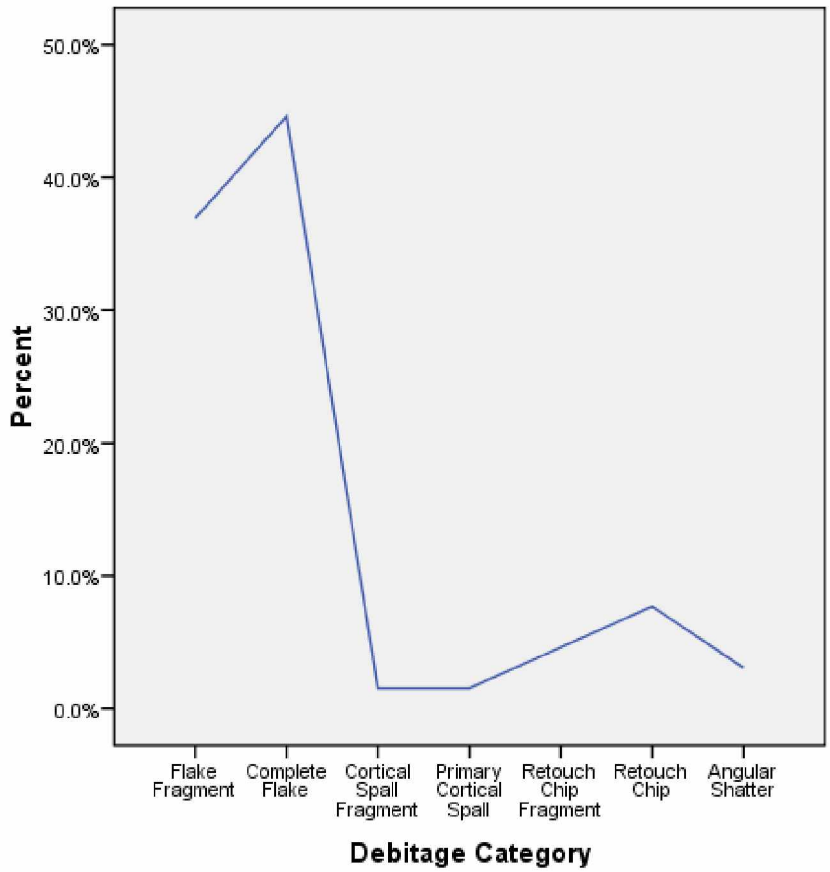

Figure 6.34. Component 5 debitage category.

Both flake fragments and complete flakes comprise the majority of debitage from Component 5. Retouch chips and retouch chip fragments are the second most common form of debitage within this component. Angular shatter follow this. Other debitage categories follow this, but in smaller quantities.

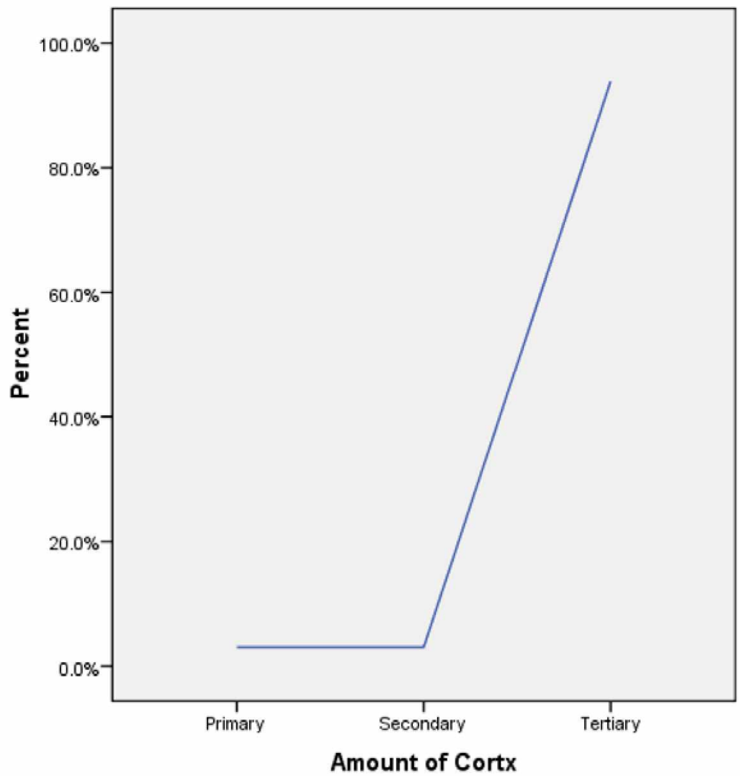

Figure 6.35. Component 5 amount of cortex.

Tertiary debitage makes up almost 100% of the debitage assemblage from Component 5. Primary cortical spalls and secondary cortical spalls are not presentl.

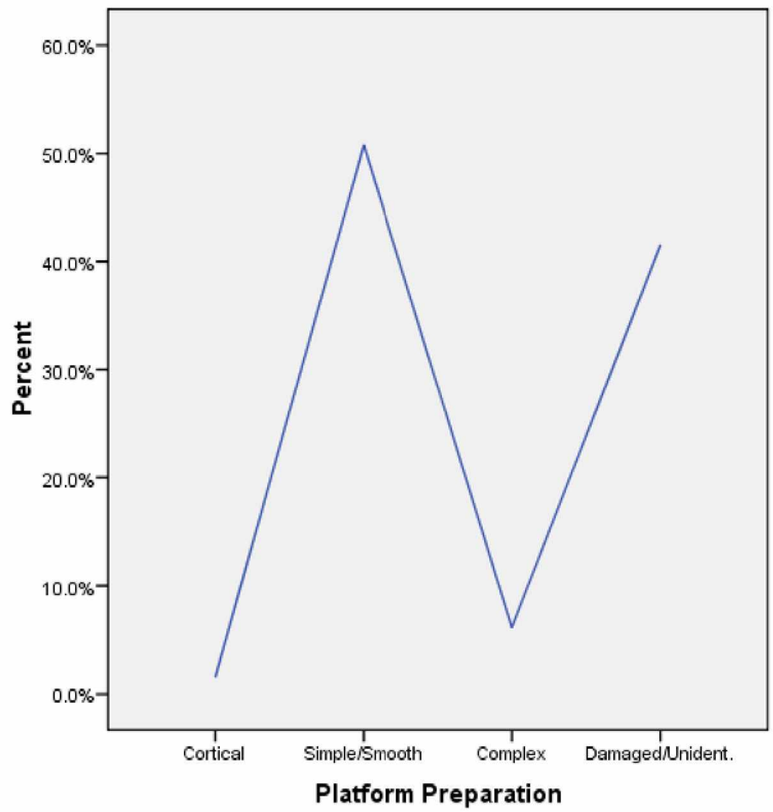

Figure 6.36. Component 5 platform preparation.

The majority of debitage from Component 5 contains simple or smooth platforms. The second most common type of platform is damaged. Complex and cortical platforms are minimal within this debitage assemblage.

Bifacial Technology

The bifacial industry of Component 5 is comprised of a single basalt biface (Table 6.13 and Figure 6.37). This biface was recovered directly under the root mat of the block extension within the middle of the trail. This biface is a mid-stage biface, which exhibits random flaking with slight marginal trimming on right margin. There are no signs of edge grinding or abrasion. Additionally, this biface does not appear to have been utilized.

Table 6.13. Component 5 biface summary data. *=incomplete.

FS#	Strat. Location	Length (cm)	Width (cm)	Thickness (cm)	Edge Angle	Tool Description
FS8; N201E194	A/B contact horizon	9.9*	6.01	1.55	44	Mid-stage biface, randomly flaked with slight marginal trimming on right margin. No edge grinding. basalt

Figure. 6.37. Component 5 biface.

Unifacial Technology

There were no unifaces recovered from this component.

Dating and Spatial Analysis

The only date (Table 6.14) for this component comes from a bone collagen radiocarbon date from a Dall sheep metapodial. This metapodial was recovered in direct association with cultural materials right under the root mat. The majority of Component 5 artifacts comes from Block 5 (Figure 6.38), however all blocks contain artifacts representing this component. Faunal remains were recovered from Blocks 1, 4, and 5, unfortunately the majority of these remains were fragmented and could not be dated. Unlike some of the other components, there is no defining raw material, which dominates or defines Component 5. All raw materials are intermixed with each other. Rather, the main defining criterion for this component is its vertical placement. This component occurs directly under the root mat but lies above the upper unknown tephra.

Table 6.14. Radiocarbon date from Component 5.

Lab Number	13C/12C Ratio	Conventional Age (B.P.)	Calendar Years B.P. (calB.P.)
Beta-283335	-17.7‰	1450±40	1400-1290

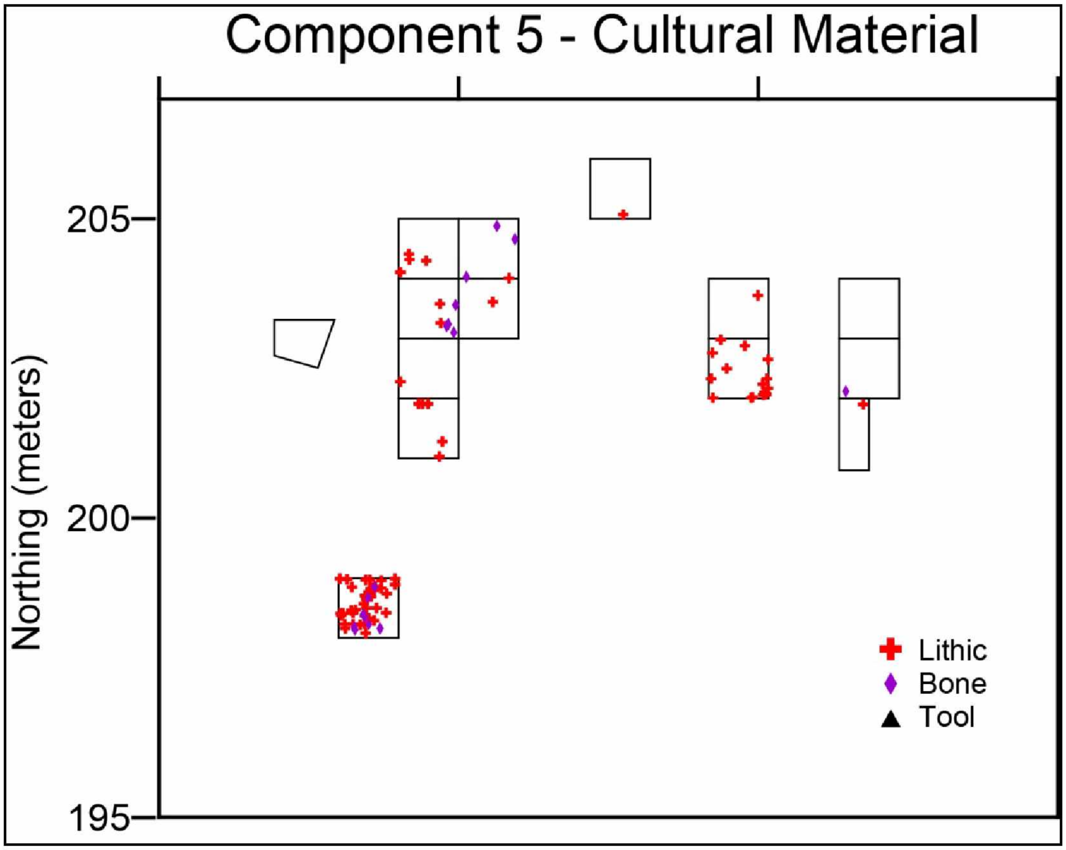

Figure 6.38. Component 5 *in situ* materials.

Discussion

Lithics comprise 87% of the total cultural assemblage from Teklanika West. Understanding the relationship lithic artifacts among components to component is important in addressing similar activities within these components. In order to understand this relationship I performed a series of Kruskal Wallis nonparametric K independent samples test on the following variables: raw material type, debitage condition, debitage category, amount of cortex, and platform preparation to test for significant differences among the components of the site. Results from these tests are shown in Table 6.15 and Figures 6.39-6.43 show the data graphed out.

Table 6.15. Kruskal Wallis test results, grouping by components.

	Raw Material	Debitage Category	Debitage Condition	Amount of Cortex	Platform Preparation
Chi-square	27.428	19.15	9.303	10.203	5.732
df	4	4	4	4	4
Asymp. Sig.	0	0.001	0.054	0.037	0.22

In three of the five tests run, there was a significant difference among components and the variables. Components differed significantly in raw material use, debitage category, and the amount of cortex present on artifacts. There was not a significant difference among the components in debitage condition and platform preparation. Despite these results, all of the components show the same general trends.

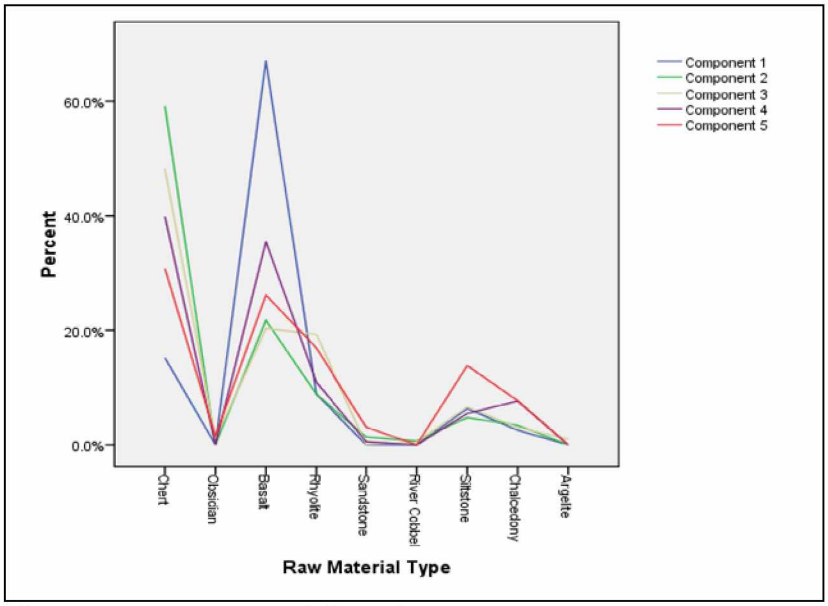

Figure 6.39. Raw material use by component.

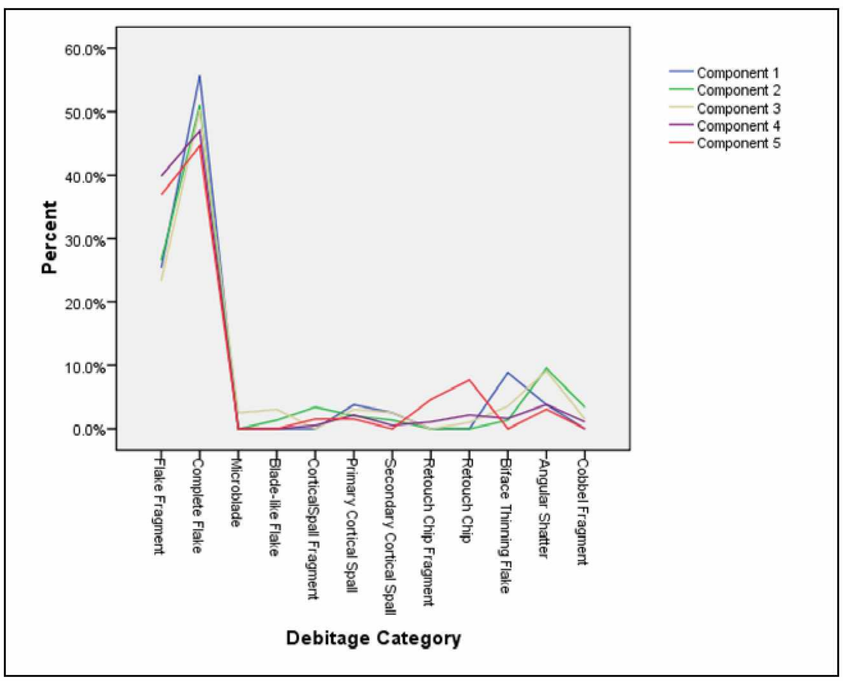

Figure 6.40. Debitage category by component.

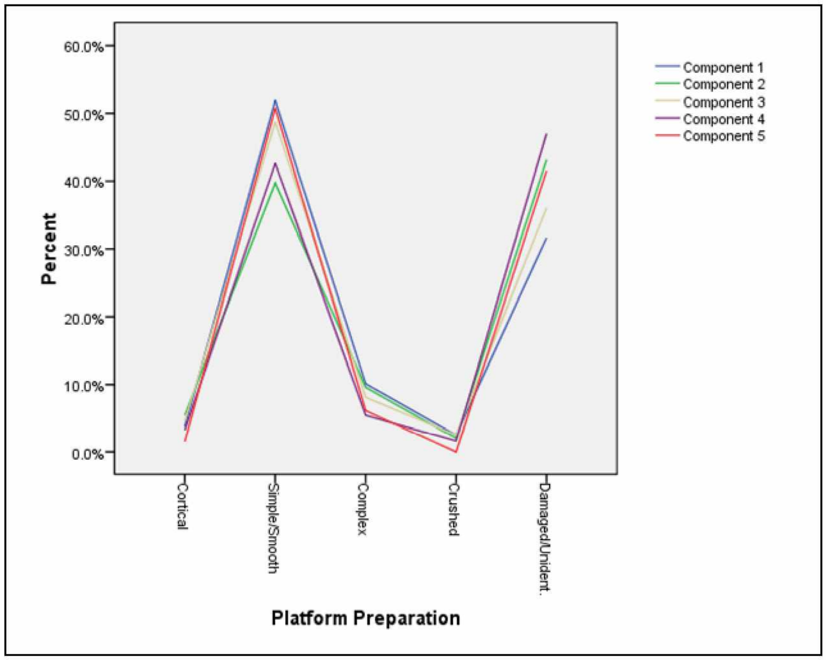

Figure 6.41. Platform preparation by component.

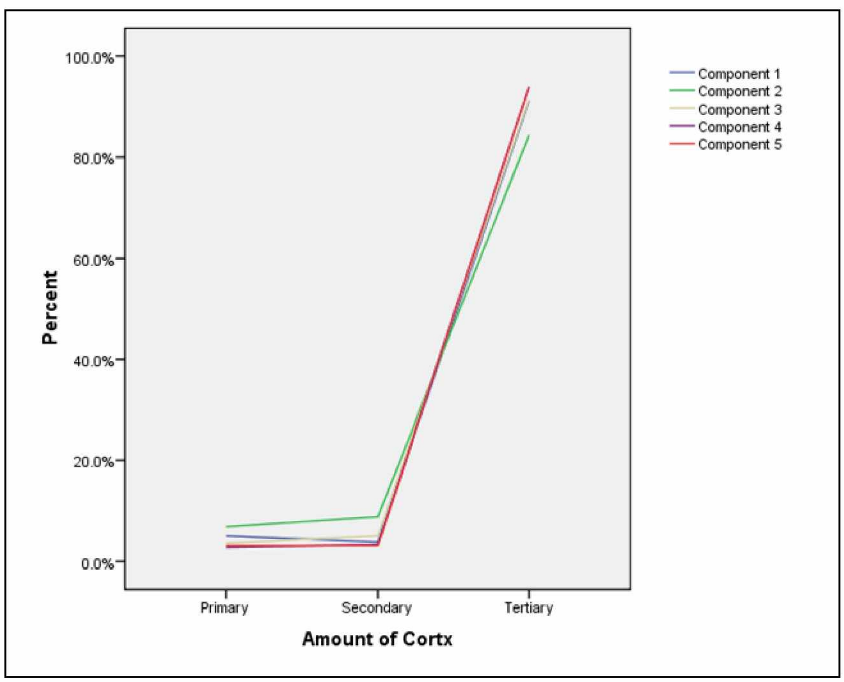

Figure 6.42. Amount of cortex by component.

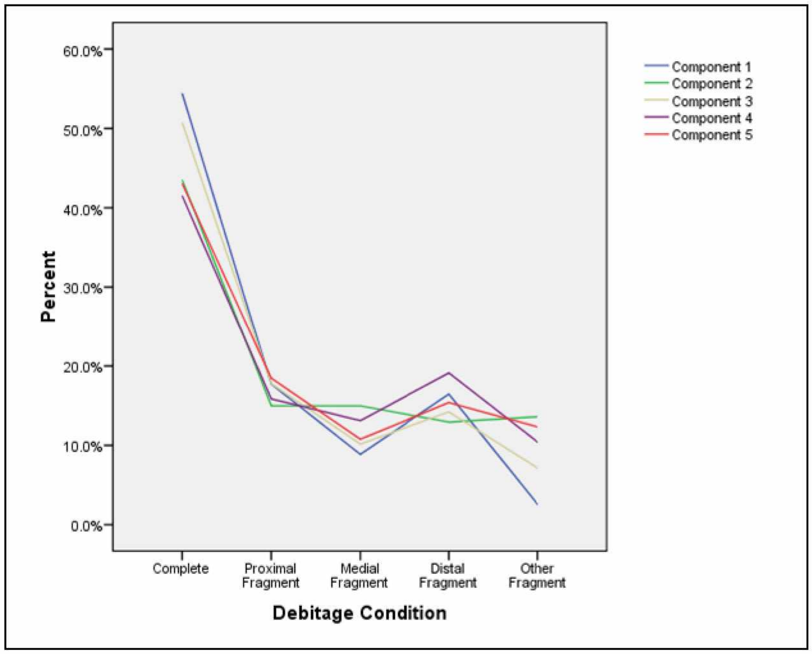

Figure 6.43. Debitage condition by component.

These data suggest that inhabitants from all components from Teklanika West were practicing a form of embedded procurement. Component 1 contains the highest amount of basalt of any component at the site. Though basalt outcrops are not immediately available, the bedrock geology of the mountains in the upper Teklanika River area are composed of mafic igneous rocks. Gravels of the Teklanika River provide and secondary source of this basalt. Thus, it is possible that prehistoric groups either directly or secondarily procured these basalt resources. Chert artifacts are widespread throughout components 2 through 5, suggesting there be a fairly local source for this material. Visual inspection of these chert artifacts with samples collected from the mountains east of the site during fieldwork show strong similarities; however, there are fair amounts of chert cobbles embedded on the gravel bar of the Teklanika River. At this time, and without any formal geochemeical sourcing data, the whereabouts of this chert are unknown but I believe the material to be local in origin. The exception of this embedded procurement strategy comes in the form of the Batza Téna obsidian from component 3, which may have been either procured directly or traded for.

Based on these statistical results and the findings of the debitage and tool analyses, sometime during the late Pleistocene, a small number of individuals visited Teklanika West. Component 1has evidence of biface manufacture and possibly butchery and hide preparation tasks. Though the debitage and lack of finished tools do not suggest this, it is plausible to suggest that meat processing to have occurred in this component, based on the faunal assemblage and its relation to the lithic artifacts. If the projectile point-base fragment is part of the Component 1 assemblage it would confirm the hunting and butchering of animals in the first component. Yet, the lack of finished tools (complete and/or fragmentary) and complete lack of microblades may be a result of my sampling strategy. It is also possible that finished tools may have been eroded down slope into the river. Future research at the site could greatly expand upon this component by concentrating excavations away from the bluff's edge and focusing on top of the bluff.

Component 2 at Teklanika West shows evidence of prehistoric hunter-gatherers processing meat and refurbishing their toolkits. This is supported by the lanceolate projectile point bases and the end scrapers. Debitage also supports this idea, as there was a large amount of cortical spalls and spall fragments. Additionally, cortical platforms and single faceted flakes comprise the two most platform types represented within this component. Based on the debitage results, Component 2 hunter-gatherers were manufacturing new stone tools, with an emphasis on biface production as microblade technology seems to be minimal; n=3 microblades. Raw materials appear to be local in origin. Having been procured at either the site or areas to the east where there is plentiful chert resources. Additionally, based on the Component 2 assemblage it is plausible to suggest faunal processing to have occurred in this component, based on the faunal assemblage and its relation to the lithic artifacts. Bison as it appears, still are present in the upper Teklanika River Valley during this time. The projectile point-base fragments from this component confirm the hunting and the end-scrapers and retouched flake confirms the butchering and processing of the animal within this component.

Despite the higher number of tools and differences in Debitage between Component 1 and 2 both are fairly similar, in terms of seasonal occupation. The minimal presence of microblade technology within the two oldest components at the site would suggest one of two things. The first is that microblades were not an integral part of the toolkits of these two components. Conversely, this lack of microblade technology may help narrow down the time of year in which the site was occupied by hunter-gatherers. Based on the notion that microblade technology was an effective way of conserving raw materials during harsh northern winters (cf. Elston and Brantingham 2002; Dixon 1999), it would seem plausible to infer the two oldest components at Teklanika West occupied the site sometime during the summer months. This is further supported by the presence of bison remains within these two components. Recent studies of ice patches (Cannon 2007) around the Rocky Mountains have shown bison moved to higher elevations to stay cool and to graze (Cannon 2007; Fryxell 1928; Hare et al. 2004;). The Teklanika West site is situated at ~760 m. (2500 ft.) asl., in an upland-like setting and would have likely been an attractive location for late Pleistocene bison to occupy. The upper Teklanika River Valley would provide cool grazing opportunities for bison during the summer months. Likewise herds of grazing bison would have been an optimal and attractive resource for humans.

Couple this with the plentiful and accessible raw material resources of the area during the summer, humans would be set to retool and secure resources for winter months.

In contrast, Component 3 contains the highest number of microblades at the site. Additionally, the component also contains presumed to be local raw materials, such as the basalt and rhyolite. However, an exotic raw material, in the form of the obsidian microblades is also present. The presence of microblades within this component possible suggests a different seasonal time of occupation. Perhaps a early spring or early fall occupation for this component's occupation seems probable. Due to the size of microblades, I lean more towards an early fall occupation. Either in that, individuals had directly procured the obsidian from the source, or it was traded in from the source. Whatever the case, it would have taken time for raw materials to arrive from the source to the site. Moreover, one would except to see smaller microblades and more conservation of raw materials in early spring, when weather conditions are fair to poor and access to raw material sources may still be difficult to get to. Unfortunately, faunal remains from this component are fragmented and addressing seasonality and subsistence use is more reliant on the lithic artifacts.

Both Components 4 and 5 are similar to Components 1 and 2 based on the presence of caribou and Dall sheep remains. These remains have assisted in understanding subsistence practices within these components but also have aided in addressing the seasonal occupation of the two components. Based on modern migration routes of caribou and Dall sheep, these animals seldom move from the uplands to the lowlands and vice-versa during the late spring and late fall. The summer months are consistent with the previous components and coincide with the near absence of microblade technology.

The site was occupied since the late Pleistocene and in that, time hunter-gatherers appear to have visited the site most often during the summer months. Though, lithic activities differed from component to component. Microblade technology was not as common as previously thought (cf. West 1965, 1967, 1996), with the exception to Component 3 (yet this component was not over loaded with microblades either). Rather there was an emphasis placed on manufacturing and/or refurbishing bifaces. More domestic activities also seem to have occurred based on the presence of scrapers and retouched flakes. Despite the statistical results, the five components are similar in many ways than one is led to believed.

CHAPTER 7: SUMMARY AND DISCUSSION

Understanding upland landuse in the interior of Alaska provides key and unique insight into early human use of the landscape. Teklanika West is an upland site that was continuously occupied from the late Pleistocene through late Holocene and offered identifiable faunal material as well as a rich lithic assemblage which has shed light on understanding human use of the uplands.

The 2009 artifact assemblage from Teklanika West has provided a much clearer understanding of what activities occurred at the site. The excavations at the site yielded new data pertaining to site chronology and human occupation history. Investigations of the site (12.50 m^2) focused on exploring basic questions of site chronology, component delineation, technological organization, and economy. I determined stratigraphy of the site consists of ~50-120 cm of aeolian silt and sand; sediments, soils and dates were illustrated in Chpater 4; Figures 4.3 and 4.4. Taphonomic disturbance in the form of both bioturbation and cryoturbation appears evident, particularly in the upper sediments (OAB horizons), with an tephra (of an unknown origin) present. This upper unknown tephra is continuous across the site at ~40 cm below the surface. The Oshetna tephra (6502-7156 cal B.P.) (Addison and Beget 2010) is also present lying right above the paleosol, see Figure 4.4. Eleven new radiocarbon dates have been able to secure chronology for the site

A synthetic approach in evaluating the research objectives was used to infer site activities and explore their contribution to our understanding of late Pleistocene/early Holocene adaptations, following current debates in the literature (e.g., Mason et al. 2001; Bever 2001, West 1996, Potter 2008, etc.). These debates stem from a normative view of sub-arctic archaeology versus more differnt views of culture.

Of which many (Dixon 1985; Powers and Hoffecker 1989; Hamilton and Goebel 1999; Goebel 2004; Yesner 2001; Yesner and Pearson 2002) have all argued that differences in lithic assemblages and technology represent different cultures, as I discussed in Chapter 3. In this case, the Nenana Complex, which lacks microblade technology, not only represents an older cultural complex in central Alaska but one that is also stratigraphically separated by the slightly younger Denali, microblade bearing complex material. Dixon (1999) has argued for a similar normative view. However, he includes a reverse migration of Northern Paleoindian bison hunters back north. He bases this idea on lithic assemblages, which tend to lack microblade technology, yet include Paleoindian style artifacts, e.g. unfluted Folsom-like lanceolate projectile points (Dixon 1999:185).

On the contrary, others (Potter 2005, 2008; Wygal 2009a) have argued these differences in lithic assemblages represent seasonal variations and seasonal functionality within the toolkit. Meaning these differences in technology may be attributed to seasonality. For example, microblade use may have been more widely used during the late fall through early spring when raw materials were covered by snow and ice. Conversely, during the mid-late spring and summer, raw material resources were more accessible and thus conservation of raw material may not have needed to be a necessity for hunter-gatherers. Meaning hunters could have used raw materials more freely manufacturing an assortment of different bifaces and other tools. Trading of higher quality raw materials may have also been easier with assistance of major waterways. While others have postulated that microblade, technology may have been relating to the hunting of specific animal taxa. Holmes (1986) argues that microblades were particularly useful in hunting northern Eurasian bison as a large herd animal, while Yesner (1989) argues that microblades were key in hunting caribou.

Given these competing hypotheses, there is a considerable lack of understanding as to what this diversity in lithic assemblages represents. Artifacts recovered from Teklanika West indicate a number of possibilities. Based on a cultural historic view, artifacts from the site may be linked to the Denali complex based on the presence of wedge-shaped microblade cores, microblades, Donnelly burins, and end scrapers. However, some artifacts may also be ascribed to Dixon’s (1999) Northern Paleoindian tradition. The fact that there are lanceolate projectile points in association with bison remains fits well with Dixon’s view of a migratory population northward hunting bison without aid of microblade technology. It is possible these artifacts represent multiple occupations at the site, one Denali and the other Northern Paleoindian. Alternatively, this diversity in lithic artifacts may just represent seasonal variations and differences in function.

Component delineations were based on bone collagen dating of taxa associated with lithics, stratigraphic association, and raw material type distributions. The lowest two components, Component 1 and 2, appear spatially separated below the paleosol. Component 1 contained two broken biface performs, a possible intrusive lanceolate projectile point base, and a side scraper. Component 1 is associated with a *Bison* sp. dated to 10,920±50 B.P. (Beta-283333) and 11,080±50 B.P. (Beta-292111). These two dates are statistically the same at a 95% confidence level (t=5.12; χ^2=5.99; df=2), with a pooled mean of 11,000±50 B.P. (12,693-13,078 cal B.P.). This component dates to the initial Younger Dryas period (Mangerud et al.1974; Meltzer and Holliday 2010), which is a period with very few archaeological components in eastern Beringia, n=16 (Hoffecker and Elias 2007:166-169). The artifact assemblage from Component 1 might represent a transition between the Nenana and Denali complexes, however, the lack of any diagnostic artifacts makes this difficult to ascertain as there are no clear frames of reference for what a transition assemblage should look like. Given the definitions of each complex, I would expect to see both macro and microblades present along with a variety of bifacial technology. Only bifacial technology is present in Component 1 making the link between the two difficult, and for now hypothetical.

What is for certain is that Component 1 of Teklanika West dates to the onset of the Younger Dryas and is firmly dated by bison remains in excellent context with cultural materials. Moreover, these dates have a low standard deviation (±50 years), with the dates overlapping at two sigma, with these dates being statically the same at a 95% confidence level ($t=5.12$; $\chi^2=5.99$; $df=2$).

Component 2 is associated with *Bison* sp. remains dated via bone collagen to 8820±40 B.P. (Beta-283334) with additional bone fragments dated at 9740±50 B.P. (Beta-292109). Though these two dates do not overlap and are statistically different ($t=206.439$; $\chi^2=3.84$; $df=1$), I believe that they represent Component 2. These two dates likely represent palimpsests of Component 2 which spans the late Pleistocene through earliest Holocene in time. The artifacts from Component 2 contain strongly convex lanceolate projectile point bases, two end scrapers, two broken bifacial performs, and a few microblades. These artifacts and date represent an earliest Holocene component at the site. The artifacts associated with this component, specifically the lanceloate bases and their association with bison remains may be related to Northern Paleoindian tradition as ascribed by Dixon (1999). The fact that there are lanceolate projectile points in association with bison remains fits well with Dixon's view of a migratory population northward hunting bison with little aid of microblade technology. The bifacial artifacts from Component 2 are not similar to those recovered from Carlo Creek (Bowers 1980) or Dry Creek component 2 (Powers et al. 1983), however subsistence remains are consistent with those of Dry Creek, bison. The microblades from Component 2 may indicate a Denali complex occupation at the site. The significance of

Component 2 is not that artifacts share/do not share similarities with known sites, but rather the faunal remains have been used to infer subsistence patterns in central Alaska, and that bison were still a viable resource during the late Pleistocene and earliest part of the Holocene. Moreover, the possibility that these artifacts may either represent a Denali complex and/or Northern Paleoindian tradition occupation in central Alaska is unique, as most Northern Paleoindian tradition sites lie further north in the Brooks Range (cf. Bever 2001, 2006).

Component 3 contained numerous bifaces, specifically two bipointed projectile points, microblades, three boulder spall scrapers, and highly fragmented faunal remains. It was stratigraphically associated with a well defined paleosol. Multiple dates on this paleosol range in age of 6770±50 B.P. (Beta-276455), 7010±40 B.P. (Beta-292107), and 7130±98 (GX-18518). A pooled mean on all three dates yielded a 6936±63 B.P. (7663-7877 cal B.P.). This component is late-early Holocene in age and temporally corresponds well with the Northern Archaic Tradition (Ackerman 2004; Esdale 2008; Dixon 1985). Additionally, microblades are present, yet they do not over populate the Component 3 assemblage as discussed by others (cf. Ackerman 1964; Esdale 2008; Potter 2008). Moreover, the ovate bifaces from is component are similar to those found at the Pond Site (GDN-94) near Kagati Lake (Ackerman 2004) a Northern Archaic site in southwest Alaska.

Component 4 contains convex lanceloate projectile point bases similar to those related to Component 2. My interpretation of these projectile point bases is that these have been re-deposited post-depositionally due to both bioturbation and cryoturbation. If this is the case, there are no diagnostic artifacts from this component. Microblades are present and are associated with caribou remains. Dating this component is based on bone collagen of caribou remains and a single charcoal date: 2400±40 B.P. (Beta-292112), 2440±40 B.P. (Beta-283336), and 2970±30 B.P. (Beta-292108). A summed mean of these three dates is 2678±37, however these dates are significantly different ($t=178.44$; $\chi^2=7.81$; $df=3$). Removing the charcoal date of 2970±30, makes the two bone collagen dates statistically the same ($t=0.5$; $\chi^2=3.84$; $df=1$) with a pooled mean of 2420±40 B.P. (2348-2544 cal B.P.). These dates are consistent with the Northern Archaic Tradition (Esdale 2008; Workman 1978) along with the Late Denali Complex (Dixon 1985). However, the lack of diagnostic artifacts makes it difficult to distinguish if this component is at all related to any of these complexes.

Caribou comprises the sole subsistence within this component. This is in line with Yesner (1989) in that caribou played an intricate role for human subsistence in the sub-arctic. Further, these data are consistent with Potter (2008) who has demonstrated a shift towards more upland animals during the mid-late Holocene with microblade presence and absence nearly the same for sites which have had large areas excavated (greater than $20m^2$ excavated).

Component 5 has a single date of 1450±40 B.P. (Beta-283335) (1295-

1403 cal B.P.). Based on lithic technology, there are no diagnostic artifacts from this component. Based on the culture history of interior Alaska this component may represent either a late Denali complex occupation or part of the Athabascan Tradition. The two microblades associated with this component can not be linked to either or, as Potter (2008) and Clark and Gotthardt (1999) have shown there to be continuity of microblade assemblages through time in the interior. Even the upper level of the Athapaskan village Dixthada contains microblades (Shinkwin 1979). Therefore, the microblades from Component 5 can not used to delineate any particular culture/tradition.

Again, subsistence practices within this component are inline with Potter (2008). There is general shift towards more upland animals, in this case Dall sheep, during the mid-late Holocene with microblade being both present and absent during this time period.

Discussion

These data demonstrate the presence of multiple components, including one dating to the Late Pleistocene. The relative lack of a microblade industry at the site might relate to the small sample size at present, but the presence of microblades in small samples in Components 2, 3, and 4 are consistent with regional continuity of this technology (Potter 2008). No Nenana Complex diagnostic materials were found in any of the components (Goebel et al. 1991). Bison were brought to the site during and after the Younger Dryas, and coupled with the bison found at the intermediate Dry Creek Component 2 (~10,000 B.P.) (Powers et al. 1983), this suggests that bison were a reliable resource in the northern foothills of the Alaska Range during and after the Younger Dryas. This exploitation strategy differs significantly from the later Holocene components, associated with modern upland ungulates (sheep and caribou).

Current interpretations of two distinct cultural traditions (Nenana and Denali complexes) separated by the Younger Dryas are more difficult to sustain given older microblade technology at Swan Point (Holmes 2001) and younger Chindadn points at Cultural Zone 3 at Swan Point (Holmes 2008). It is unclear at present how Teklanika West data fit into the broader cultural chronology of the region, but early interpretations of a single microblade-rich Denali Complex occupation at the site are incorrect. These data have helped to elucidate lifeways of early populations in upland regions of central Alaska.

Future Research Prospects

The 2009 excavations at Teklanika West were able to provide answers to a number of previously unanswered questions. Yet, there are avenues for future work to be conducted at the site. A number of these questions were not addressed herein, as it was beyond the scope of this thesis. From a management standpoint, identifying the boundaries and extent of the site need to be established. This would assist the National Park Service in managing and protecting the site from erosion and active pedestrian traffic. This would also help narrow down areas at the site where future excavations could be established.

Future academic research prospects are more bountiful. There is a considerable amount work that could still be performed at the site. Specifically, trying to understand the relationship, if any, Component 1 may share with the Nenana or Denali complexes. As I have discussed and as the data show, there are not many formal artifacts from Component 1, but the few recovered from this level do not share any similarities between either the Nenana and/or Denali complexes, respectively. In establishing this possible relationship, researchers should focus efforts on locating features and/or more dateable materials while also trying to locate diagnostic artifacts. Additional research, such as those dealing with seasonality will further the possible connection Nenana may share with Denali and will assist in understanding how Component 1 of the site factors into this schema.

Additional future research might also seek to address the possible relationship Component 2 shares, if any to the Northern Paleoindian tradition and to what extent does microblade technology play within this component? These data have shown microblades are present, but in low quantities and likely did not play a vital role in the Component 2 toolkit.

Lastly, Components 4 and 5 have been radiocarbon dated and temporally fit with different cultural chronologies of the area (cf. Dixon 1985; Lynch 1996), yet no diagnostic artifacts were recovered from these components. Moreover, artifacts representing these components were sparse, possibly representing an indication that either the main activity areas of these components were not encountered or that these components barely utilized the site. Possibly locating these activity areas could shed further information on how humans used the upper Teklanika River valley during the late Holocene.

Teklanika West is now the oldest archaeological site in Denali National Park and Preserve and unlike the Bull River 2 site (Wygal 2009a) in the Broad Pass area of the park, Teklanika West has been able to contribute to subsistence practices and resource management of prehistoric hunter-gatherers. The 2009 Teklanika West collection is housed at the museum in Denali National Park and Preserve and will be curated to facilitate future study.

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